History, productions and resources of the Cape of Good Hope : official handbook / edited by John Noble.

Contributors

Noble, John, 1837-1898.
Cape of Good Hope (South Africa). Committee for the Colonial and Indian Exhibition, 1886.
Royal College of Physicians of London

Publication/Creation

Cape Town : Colonial & Indian Exhibition Committee, 1886.

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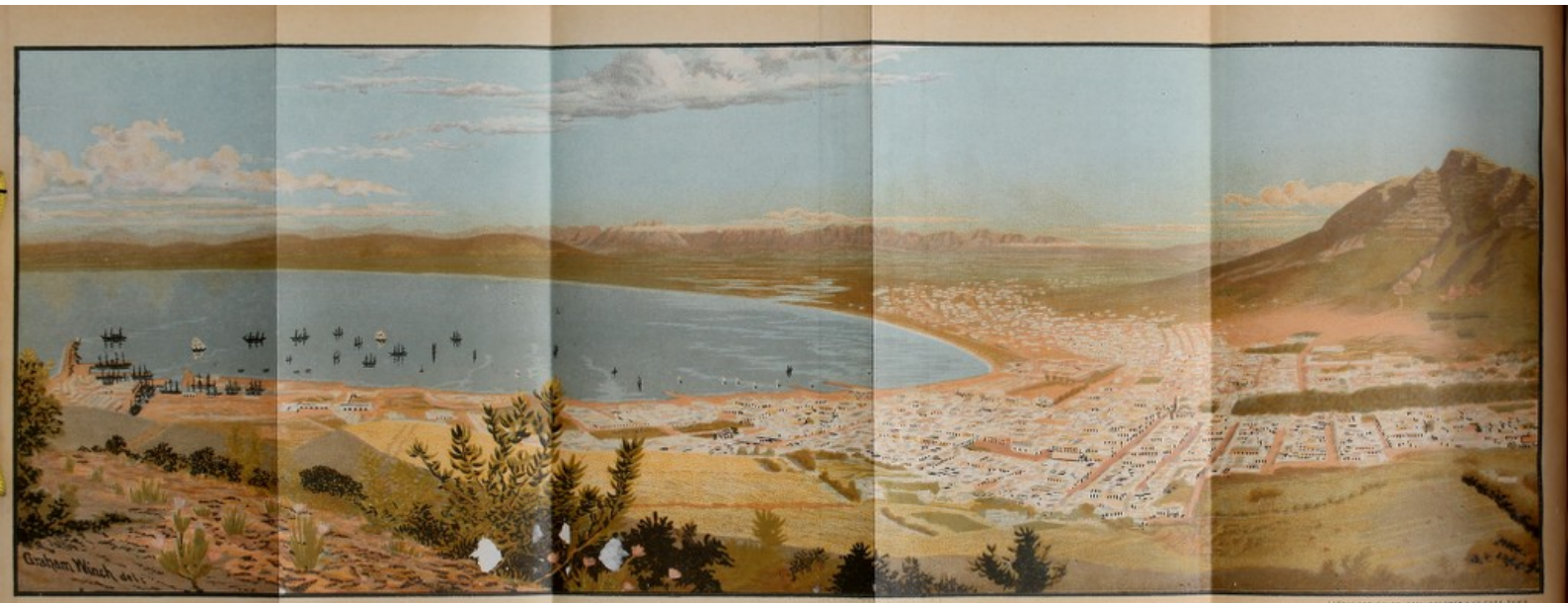

CAPE TOWN AND TABLE BAY IN 1836

From Sketch by Graham Winch

ILLUSTRATIONS PRINTED, BOUND AND PUBLISHED

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CAPE CENTRAL COMMITTEE, COLONIAL & INDIAN EXHIBITION,

BY SAUL SOLOMON & CO., CAPE TOWN.

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OFFICIAL HANDBOOK.

HISTORY, PRODUCTIONS, AND RESOURCES

OF THE

CAPE OF GOOD HOPE.

EDITED BY

JOHN NOBLE,

CLERK OF THE HOUSE OF ASSEMBLY;

Author of "South Africa, Past and Present, &c."

CAPE TOWN:

PRINTED FOR THE COLONIAL AND INDIAN EXHIBITION COMMITTEE,

BY W. A. RICHARDS & SONS, GOVERNMENT PRINTERS.

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PREFACE.

THIS volume on the History, Productions, and Resources of the Cape of Good Hope has been undertaken and prepared at the request of the Committee appointed by the Government for the representation of the Colony at the Colonial and Indian Exhibition to be held in London during the present year.

Eleven years ago, I published, at the request of the Government, the first Descriptive Handbook of the Cape Colony; and, looking retrospectively at the stage of progress then recorded, and the changes and material improvements which have since taken place, one cannot fail to recognise the great advance that marks the past decade, especially in the opening up of interior communications.

The transition now effected from the old bullock-wagon mode of progression to that of the iron-horse and the railway, is suggestive of a potentiality of wealth and prosperity, only awaiting the application of intelligence, enterprise, and energy to the development of the vast natural resources of the country.

Interruptions to our progress may occur, as at the present time, from long-continued and severe droughts, from changes in the world's markets, or from neglect of our staple products for more alluring but illusive investments. Such apparently-disastrous checks, however, leave a legacy of valuable experience, and generally stimulate to greater effort and more careful industry. Certain it is, that whenever the flowing tide of our prosperity has been stopped by these or other repressing circumstances, the Colony has always, with marvellous recuperative power, sprung up again and bounded forward at an increased pace. Our present position may accordingly be regarded as but a temporary pause to concentrate fresh energy for a new stage of production and development.

In writing and editing this volume, the object kept in view has been to supply useful, instructive, and reliable information with regard to the condition and resources of the Colony of the Cape of Good Hope alone; all reference to the aspects, conditions, or political relations of other Colonies, States, or Territories of South Africa has, therefore, been excluded.

To the gentlemen who have assisted with their special contributions, I beg to acknowledge my obligations, as well as to those who have in various ways aided me with information for the Handbook, and among whom I take the liberty of mentioning Mr. Hampden Willis, Under-colonial Secretary, and the officers of his department; Mr. A. de Smidt, Surveyor-General, and the officers of his department; Dr. Langham Dale, Superintendent-General of Education; Mr. T. Stewart, As. M.I.E., of the Hydraulic Engineer's Department; and Messrs. R. Hare, P. Ryan, E. J. Dunn, and the Rev. G. W. Stegmann.

I may add with pleasure, that this volume is in every respect a Colonial production, the printing of the letter press having been performed by Messrs. Richards & Sons, the Government Printers; the maps and plans prepared and put upon the stone in the office of the Surveyor-General; and the lithographic illustrations and binding executed by the old-established firm of Saul Solomon & Co., to whose artist, Mr. Graham Winch, a meed of praise is due.

JOHN NOBLE.

Parliament Houses,
Cape Town, February 24th, 1886.

GREAT
NAMAQUALAND
KALAHARI
DESERT
BRITISH
BECHUANALAND
TRANSVAAL
ORANGE FREE STATE
GRIQUALAND WEST
BARKLY
VICTORIA
HOPE TOWN
CARNARVON
FRASERBURG
CALVINIA
NAMAQUALAND
ZULU
LAND
NATAL
BASUTO
LAND
GRIQUALAND EAST
KOKSTAD
TEMBULAND
PONDOLAND
SOUTH ATLANTIC OCEAN
SOUTH INDIAN OCEAN
MIDDELBURG
BEAUFORT WEST
ALBERT
WILLOWMORE
GRAAFF REINET
ALEXANDRIA
SOMERSET
PORT ELIZABETH
Port Elizabeth
Cape Town
Orange River
Green River
Olifants River
Berg River
Great Fish River
Kowie River
Keiskama River
Buffalo River
Umtamvuna River
Umzimkulu River
Durban
Pietermaritzburg
Ladysmith
Newcastle
Harrismith
Bloemfontein
Kimberley
Graaff Reinet
Cradock
Aliwal North
Colesberg
Victoria West
Prieska
Upington
Calvinia
Clanwilliam
Malmesbury
Worcester
Paarl
Stellenbosch
Caledon
Swellendam
Riversdale
Knysna
George
Oudtshoorn
Uniondale
Port Alfred
East London
Queenstown
Aliwal North
Barkly East
Mount Fletcher
Matatiele
Kokstad
Umzimkulu
Port Shepstone
Verulam
Richmond
Estcourt
Dundee
Utrecht
Vryheid
Wakkerstroom
Standerton
Heidelberg
Vereeniging
Potchefstroom
Lichtenburg
Mafeking
Vryburg
Taungs
Mosita
Thaba Nchu
Ficksburg
Wepener
Ladybrand
Rouxville
Smithfield
Philippolis
Hopetown
Douglas
Prieska
Carnarvon
Fraserburg
Sutherland
Beaufort West
Prince Albert
Ceres
Tulbagh
Worcester
Paarl
Wellington
Malmesbury
Piquetberg
Clanwilliam
Calvinia
Namaqualand
Port Nolloth
Kuruman

DISCOVERY AND EARLY HISTORY OF THE CAPE.

The world is indebted to the Portuguese navigators of the fifteenth century for the discovery of the Cape of Good Hope. Some traditions of Phoenician voyagers having circumnavigated Africa in earlier times have been handed down to us by ancient writers; but the first unquestionable historical record we have of any explorers sailing round the southern extremity of this continent is that relating to the voyage of Bartholomew Diaz and Joa Infanta in 1486.

Towards the end of August in that year, the King of Portugal, John II., sent out two ships of fifty tons each, and a tender laden with surplus supplies of food, to proceed along the coast of Africa, beyond the points which had already been explored, in the hope that they might reach its further extremity and ultimately discover a seaway to India.

The navigators carried with them stone pillars, each in the form of a cross, which they erected at such capes, bays and headlands as they discovered; and amongst other points selected for this purpose was the mouth of the Orange River (now the north-western boundary of the Cape Colony), which they named Cape Voltas, owing to the many tacks (voltas) they had to make from adverse winds at that place. Steering thence seawards, they were compelled to run for thirteen days with sails shortened, encountering seas which, as their vessels were small, they considered highly dangerous. However, the tempest which lashed the waves with fury having abated, they tried to reach the land by shaping their course eastwards, thinking the coast line still extended north and south. But, finding that they sailed several days without sighting it, they took a northerly course until they came to a bay which they named "Los Vaquiros," or the Bay of Cowherds (the present Vleesch Bay, near Gouritz River), on account of the number of cattle they saw on land tended by native herdsmen.

Proceeding further along the coast, on their new course, they came to an indent (now known as Algoa Bay) where they landed on a small Island, and Diaz set up a pillar named "Santa Cruz," but, as there were two springs on the island, some called it the

"Fountain Rock," and by both terms the island is still known. This was the first land, beyond the Cape, which was trodden by European feet. The crews of the ships at this point began to complain; they were worn out with fatigue and alarmed at the great seas they had passed, and protested against going further, saying that quite enough had been discovered; that they were sure the land trended more and more eastward, whence it would seem there was behind them some great Cape, and that it would be a better plan to turn back for the purpose of seeking it. Diaz greatly desired to prosecute the voyage, but by way of compromise proposed that they should proceed two or three days further along the coast, and should they not by that time make any discovery which might induce them to continue, they would be at liberty to turn back. This was agreed to. At the end of the time mentioned, however, they had only reached a river some twenty-five leagues eastward, and as Joa Infanta, the Captain of the second ship, was the first to land there, the river was called Rio de Infanta. It was the estuary now known as the Great Fish River mouth

On the return voyage, the navigators sighted the remarkable mountain range of the Cape Peninsula; and Diaz and his companions named its southern extremity "Cabo Tormentos," or Stormy Cape, in remembrance of the rough seas they had passed through in doubling it; but upon their arrival in Portugal, when they made report of their discovery, the King, on account of the promise it gave of the much longed-for ocean-route to India, bestowed upon it the name by which the southern land of Africa has ever since been known, "Cabo de Boa Esperança"—THE CAPE OF GOOD HOPE.

After an interval of ten years, another fleet was sent out from Portugal, in confident expectation of reaching India by the Cape route. The command was given to Vasco da Gama, who doubled the Cape of Good Hope on the 20th of March, 1497, and, after touching at Natal and Mozambique, successfully reached India in the following month of May. In rounding the Cape he touched at Mossel Bay (which Diaz had named San Bras), and there he was the first to hold intercourse with the Hottentots of South Africa. He describes them as "negroes with frizzly hair; they value their flocks of cattle very highly, and some of them our men saw were very fat and clean, and women rode upon them, on pack saddles of reed. Our crews were much entertained by these natives, as they are a pleasure-loving people, given to playing on musical instruments and dancing; and among them were some who played upon a kind of pastoral reed, which seemed good after its fashion."

The incidents of Da Gama's voyage furnished material to the Portuguese poet Camoens for his great national epic, the "Lusiad,"

in which he thus romantically describes the Cape and its aboriginal inhabitants:—

As from the wave the chariot of the day,
Whirl'd by the fiery coursers, springs away,
There, full in view, the giant Cape appears,
Wide spread its limbs, and high its shoulders rears.
Behind us, now, it curves the bending side,
And our bold vessels plough the eastern tide.
Nor long excursive off at sea we stand,
A cultur'd shore invites us to the land.
Here their sweet scenes the rural joys bestow,
And give our wearied limbs a lively glow,
The tenants of the coast, a festive band,
With dances meet us on the yellow sand;
Their brides on slow-pac'd oxen rode behind;
The spreading horns with flow'ry garlands twin'd,
Bespoke the dew-lapp'd beeves their proudest boast,
Of all their bestial store they valued most.
By turns the husbands, and the brides, prolong
The various measures of the rural song.
Now, to the dance the rustic reeds resound;
The dancer's heels, light quivering, beat the ground:
And now, the lambs around them bleating stray,
Feed from their hands, or round them frisking play.
Methought I saw the sylvan reign of Pan,
And heard the music of the Mantuan swan:
With smiles we hail them, and with joy behold
The blissful manners of the age of gold.

During the century and a half succeeding these discoveries, the Cape was used as a temporary place of call by the Portuguese, English, and Dutch, respectively, who engaged in the Eastern ocean-trade. Their ships resorted to Table Bay for water and live-stock, which they obtained from the natives. They also made it a means of postal communication: outward-bound vessels buried their letters or despatches and European news at certain spots, indicated by square stones, on which were engraved the names of the ships; and the return fleets carefully searched for these to obtain intelligence from their homes or of their countrymen. But no permanent settlement was attempted by any of the maritime powers of Europe until 1652, when the Dutch East India Company, under charter granted by the States-General of the United Provinces of Holland, took possession of Table Bay, establishing a fort, and occupying the lands skirting the foot of Table Mountain, chiefly with the object of having always in readiness supplies for the refreshment of their passing ships.

Jan Anthony van Riebeek, a surgeon and merchant in the service of the Company, who in one of its return fleets had spent a few weeks at the Cape, and had previously voyaged to China, Japan, the West Indies and Greenland, was chosen the first Commander, or Governor, of the new settlement. He left the Texel on the 24th December, 1651, with three ships, the *Dromedaris* (which carried his flag), the *Reijger*, and the *Goede Hope*, and anchored in Table Bay on the 6th of April, 1652. He was accompanied by his family, and was provided with necessary materials and mer-

chandize, and authorized to land from the ships about a hundred men to form a garrison, erect a residence and defensive works, and constitute the embryo colony.

In accordance with instructions, they erected near the beach on what is now the Military Parade-ground, Cape Town, a small earthenwork fort, "as a stronghold against any attempts of the savages," and, under protection of its eight-pounder cannon, the first inhabitants laid out their gardens and pastures. They first raised vegetables and grew corn. They afterwards introduced and propagated the vine, the orange, the olive and other fruit trees. They bartered brass, beads, brandy and tobacco for the cattle and sheep of the Hottentots. And from time to time they sent out small expeditions, to penetrate into the Interior, with a view to make search for more profitable commodities for trade, and to learn "more and more of the secrets of Africa," and especially to try and find a way inland to the auriferous lands of Monomotapa and Sofala, which even in those days were believed to be the true Ophir whence King Solomon had imported his gold.

The daily life and progress of the little garrison of the Fort de Goede Hope are minutely detailed in the quaint and interesting "journals" and "despatches" of Van Riebeek and his successors, still preserved in the Archives of the Colony.

The first act of the founder of the settlement, immediately after his arrival in Table Bay, was to hold a council of his officers on board the principal ship, the *Dromedaris*. The proceedings were solemnly opened by supplicating the blessings of Heaven upon the important work in which they were about to engage. They prayed that "as they were called to the government of the affairs of the Cape of Good Hope,—to advise and take such measures as might best tend to promote the interests of the East India Company—to maintain justice, and, if possible, to implant and propagate the true Reformed Christian doctrine amongst the wild and savage inhabitants, for the praise and honour of God and the benefit of their employers,—it might please the Almighty Father to preside at their assembly, and with heavenly wisdom enlighten their hearts, and remove all perverse passions, misunderstandings and other defects and human weaknesses, that their minds might be so composed, that in all their deliberations they should not resolve anything which would not tend to the praise and glory of His holy name and the benefit of their masters, without considering in the least their own personal advantage or profit." This form of prayer was in use at every succeeding meeting of the Council, and on every Sabbath day service was held, and a sermon read either by the Commander, or by Willian Barends Wylandt, the Chaplain, or "sick comforter" as he was called, who, although not ordained discharged minor clerical functions.

The Council at their first meeting resolved that the Commander Jan van Riebeek, accompanied by the Captains of the ships, David Connick, Johan Hoegsat, and Simon Turver, should land with some armed soldiers, to inspect and measure a place fitted for a fort, and that the carpenter and men of the ships with all speed should erect, within the boundaries of the fort, a convenient store and dwelling house according to a plan furnished to them.

The landing of Van Riebeek to select the site of the fort, and his interview with the Hottentots, "making use of signs and many broken Dutch and English words," has furnished a subject for one of the few historical paintings to be found in the Colony. The accompanying illustration is a copy of an admirable picture, executed by the late Charles Davidson Bell, formerly Colonial Surveyor-General, which was originally in the possession of the Hon. William Porter, and was by him presented in 1861 to the South African Public Library.

On the 10th of April, work was commenced on the fort; but a number of the men landed from the ships proved to be so unskilful, weak, sea-worn, and scorbutic, as to render comparatively little aid; and the Commander had to set to work himself as engineer, excavator, carpenter, mason and blacksmith. He and his family took up their quarters in a leaky hut on shore until better accommodation could be provided for them. By his continual presence, however, the work advanced. The end of the following month saw the Residency sufficiently completed for occupation; and on the 6th of June, within its walls the Chaplain's wife was delivered of a child, the first of European stock born at the Cape. Meanwhile, the Commander made several excursions to acquaint himself with the surrounding country. In the kloofs or ravines of Table Mountain he found fine, thick and fairly long trees, fit for masts for ships, but difficult to remove. On some of them the dates 1604, 1620, and 1622 were found carved. Harts, elands, steenbuck and other game were plentiful; but so wild that they could not be approached. The hippopotamus and rhinoceros were in near neighbourhood; and one evening a lion killed the cattle of a Hottentot quite close to the fort. A day or two afterwards, says the Journal: "The Commander while walking in the garden [where the Parliament Houses now stand] found traces of wild animals all over it, and soon after a large lion sprung up from the outside of the ground, forty or fifty paces off, and walked slowly towards the mountain. We therefore sent after him a sergeant, a hunter, and four or five soldiers with firelocks; upon which fully two hundred Hottentots instantly pursued with all their sheep and cattle and surrounded the lion in a deep kloof on the side of the mountain, so that he could turn in no direction without forcing his way through the sheep, which

they opposed to the lion as their breastwork, while he lay under a stump. They stood outside of the flock of sheep, and between them and the cattle, and whenever the lion gave a spring and a roar, and seized a sheep, they threw their assegais over the sheep with loud cries, on which the lion retreated. It was a very singular spectacle; but as they could not well hit him, the sergeant, standing with the rest eight or ten yards from the lion, fired but without effect, when the hunter fired and shot him dead with three balls through the head. The Hottentots then showed themselves brave men, and would have stabbed him a hundred times after he was dead, but they were prevented lest they should injure the skin which, when stuffed, will be hung in the great hall used as a church. The lion weighed four hundred and twenty-six pounds Dutch weight. The lioness was, the following night seeking her mate near the gate, and also ate part of his carcase."

The winter of 1652, from July to August, was an exceptionally severe one; part of Table Mountain was white with snow, and so much rain fell that the land resembled a sea. There was much sickness and several deaths among the garrison. But all the privations and discomforts of these months were forgotten with the advent of the Cape spring, in September, when the verdure of the hills and the valleys afforded pleasure to the eye; and the Commander had the satisfaction of enjoying some of the products of his own garden—"giving a parting dinner to the officers of the yacht *Goede Hope*, entirely of chickens reared at the Cape, shell-less peas, spinach, chervil, pot-herbs, asparagus as thick as the finger, and salad as compact as a cabbage, weighing fully a pound and a quarter."

The natives appear to have received the Europeans in a friendly manner. The skipper, Captain Hoegsat, on first landing, met nine of them at the Salt River; "they were handsome active men of particularly good stature, dressed in ox-hides, tolerably prepared and carried gracefully on one arm, with an air as courageous as any brave in Holland could carry his cloak on arm or shoulder. When they heard that he commanded one of the ships, they clasped him round the neck with great joy, intimating that for copper and tobacco they would bring cattle enough." Other officers of the garrison, upon visiting neighbouring kraals, were likewise courteously received. "Upon arriving at the residence of the chief or captain they found him very polite. He welcomed them and led them round to see his riches in huts—fifteen in number—and in cattle and sheep, in all 1,500 or 1,600 in number; after which he let them enter and rest and sit in his house of mats, very handsomely made and rather large, and having desired some women to bring milk entertained them in a very kind and friendly manner. Here they saw the children sucked at the

udders of the sheep, which the mothers gave them. The chief seemed much respected, and understood also very well how to maintain his dignity."

Van Riebeek himself met with an equally demonstrative welcome on the occasion of his visit to a kraal or encampment on the eastern side of Table Mountain. The camp, which numbered 100 inhabitants, including women and children, consisted of sixteen tolerably large mat houses, neatly disposed in a circle and enclosed with brushwood fastened together as a breastwork, with two openings or passages for the cattle to be driven out or in, morning or evening. This passage was occupied by about thirty young fellows, their skins and cloaks thrown off, entirely naked, but well provided with assagais, bows and arrows. On approaching, the Governor held out his hand to them with a friendly gesture, and "instantly they kissed their hands and came on joining hands with him and embracing with great fervour like the greatest friends in the world." The Governor, however, had occasion to lament these amicable embraces, for he says, "We had again a suit of clothes destroyed from the greasiness of the oil and filth with which they, and particularly the greatest amongst them, had so besmeared themselves, that they shone like loooking-glasses in the sun, the fat trickling down from their heads and along their whole bodies, which appeared to be their greatest mark of distinction."

As the object of the settlement, at the beginning, was to furnish supplies to the outward and homeward bound ships, and as the principal supplies in the shape of sheep and cattle were only to be obtained from the Hottentot tribes, special directions were given to treat them with all kindness and favour, so as to gain their affection and confidence. Anyone found abusing, ill-treating or pushing any of them, whether he was in the right or in the wrong, was liable to be punished with lashes in their presence. The beach-rangers and watermen occupying Table Valley frequently manifested a pilfering and thievish disposition, and on one occasion some of them treacherously murdered a European youth who was herding cattle near the Lion's Hill; but the Commander forbad all reprisals; and indeed ordered that the people should be treated with greater kindness than before, lest by indiscriminate vengeance the innocent should suffer for the guilty.

For a few years, the intercourse between the new and the ancient occupants of the country was carried on in an amicable and humane spirit. Van Riebeek having suggested to his masters that their original plan of settlement might be extended and some free men allowed to take up their residence at the Cape as "boers" or farmers, but subject to the Company, authority was given in 1656, that the cultivation of the lands might be enlarged, for the promotion of agriculture and the growth of all kinds of garden

fruits. Nine soldiers and sailors at this time received their discharge, and were granted the privilege of free men and burghers, and located near Rondebosch. When the tribe known as "Caepmans" saw these white men ploughing the ground where they were wont to dig out roots for their winter food, and their cattle had been accustomed to graze from time immemorial, they became alarmed. It looked as if the Europeans intended to take permanent possession of their country, and according to the words of one of them, they resolved to prevent and to "dishearten the colonists by taking away their cattle, and if that did not produce the effect, then to burn their houses and corn until they were forced to go away." They called the tribe of the Gorachouquas to their aid, and swept off a number of the colonists' cattle. Thus commenced the first colonial war, which occurred in 1659. The colonists and garrison at the time were few in number, but they were fortunately reinforced by the crews of some vessels which had put into Table Bay. Hostilities continued for many months; and after two engagements, in which seven natives were killed and one of their leaders wounded, they came to the Company's Fort, sueing for peace, which was at once concluded, and both parties engaged not to molest each other in future.

How they smoked the calumet of peace is thus told in the Journal of van Riebeek:—

1660. April 6. This day peace was renewed at the Fort with the Captain and chief of the Caepmans, Herry and all the principal and oldest of the tribe. . . . They dwelt long upon our taking every day for our own use more of the land, which had belonged to them from all ages and on which they were accustomed to depasture their cattle, &c. They also asked, whether, if they were to come into Holland, they would be permitted to act in a similar manner, saying, "What would it signify if you remained here at the Fort, but you come quite into the interior, selecting the best for yourselves, and never once asking whether we like it, or whether it will put us to any inconvenience." They therefore insisted very strenuously that they should be again allowed free access to the pasture. It was at first objected that there was not grass enough for their cattle and for ours also. They said in reply, "Have we then no cause to prevent you from procuring any cattle? for if you get many cattle, you come and occupy our pasture with them, and then say the land is not wide enough for us both. Who then can be required, with the greatest degree of justice, to give way, the natural owner or the foreign invaders?" They insisted much upon their natural right of property, &c., and that they should at least be at liberty to gather for their winter food the bitter almonds and roots which grew there naturally; but this also could not be acceded to, because, on the one hand, it would give them too many opportunities to injure the colonists, and on the other, because we this year had need of the bitter almonds ourselves, for the purpose of planting the projected hedge or live fence (a reason which

was not stated to them), but they insisted so much on this point, that our word must out at last: That they had now lost that land in war and therefore could only expect to be henceforth entirely deprived of it, the rather because they could not be induced to restore the cattle which they had, wrongfully and without cause, stolen from us; that their country had thus fallen to our lot, being justly won by the sword in defensive warfare, and that it was our intention to retain it. In opposition to this, they complained much that the colonists and others living in the country had given them much annoyance, with now and then perhaps stealing a sheep or a calf, &c., taking from them their beads, earrings, and bracelets, and giving them to their slaves, also with beating and pushing, &c., without the Commander knowing exactly about it all (in which there is some truth), and that they therefore, not being able to bear this any longer, had resolved to take revenge by stealing the cattle; and thus they roundly maintained that they had cause enough.

In reply to this, we reminded them of the numerous instances of punishments enacted by us against those of whom they were accustomed to complain, for these and similar annoyances, &c., and that if they were not to be satisfied thus but were always to revenge themselves by robbery and theft, peace could never be maintained betwixt us, and they would lose still more of their land by the right of conquest, unless indeed they had the courage to expel us, in which case they would become, by virtue of the same right, owners of the Fort and all, and would continue such as long as they could hold it, and if they were disposed to try that, we should consider of what we must do.

On this they said that this was a recital of past events, and that they were contented henceforth never to think of molesting any of our people, but to complain to us of any that molested them in order that they might, after due enquiry, be punished by us according to their deserts, as they also would do upon their side; and that they would wait for some day when the Commander went out, that he might point out to them the roads they must take and the limits beyond which they must remain, &c.; this was postponed until the departure of the ships now in the roads.

The peace was then concluded, and the chief Gogosoa, Herry and all the principal people, about 40 in number, received presents of brass, beads and tobacco, and were so well entertained with food and brandy that they were all well fuddled, and if we had chosen we could have easily kept them in our power, but for many weighty reasons this was not deemed expedient, as we can do that at any time, and meanwhile their disposition can be still further sounded.

The authorities in Holland, on receipt of news of the war, were very uneasy. Their hopes of a peaceful occupation of the Cape were rudely dispelled by these hostilities with the Hottentots; and they feared such conflicts would be continually repeated with one or other of the more inland tribes. They wrote, "The discontent shewn by these people in consequence of our appropriating to ourselves—and to their exclusion—the land which they have used for

their cattle from time immemorial is neither surprising nor groundless, and we therefore should be glad to see that we could purchase it from them, or otherwise satisfy them."

This suggestion of purchasing territory was carried into effect a few years afterwards. A purchase was made in 1672 from two of the Hottentot Chiefs, who claimed to be hereditary sovereigns, of all the country from the Cape Peninsula to Saldanha Bay, "lands, rivers, creeks, forests, and pastures inclusive," but with the condition that where the colonists did not occupy the arable lands or pastures, the natives might erect their kraals and graze their cattle freely. The purchase amount of this cession was paid for in brandy, tobacco, beads, and merchandize of the value of little more than one hundred florins, or not quite ten pounds sterling.

The handful of men who, under the title of "Free Burghers," took their discharge from the garrison and the Company's service, may be termed the first colonists of the Cape of Good Hope. They were natives of Holland and Germany, the latter country furnishing the Dutch East India Company with a large proportion of its servants. They were well supplied by the Company, on credit, with cattle, implements, and seed, with which to carry on their farming operations. As no servants could be got on hire from the Hottentots, slaves were imported for them, and in some cases the services of a few of the single men forming the garrison were lent to them. They were allowed as much land as they could bring under cultivation, and were exempted from the payment of taxes for three years, but subsequently were made liable to an assessment, which was fixed at one-tenth of all produce raised from their lands, and also a tenth of all stock from the pasture lands they were allowed to occupy. The Chamber of Seventeen directed that they were to be encouraged as much as might be without injury to the Company; and so far they were treated with all the liberality of which its system was susceptible.

Care was taken, however, that the Company should be lords and masters of the settlement in every way, monopolising the importations, productions, and trade of the inhabitants altogether for its own advantage. The free burghers might not buy anything but what came from the Company's store and at the Company's price, and they were bound to deliver all their produce to the Company on terms to be fixed at the discretion of its officers. Traffic with the natives was strictly forbidden, lest prices should become too high for the Company when inclined to purchase. This rule for a short time was so far relaxed as to allow them to buy breeding cattle, provided that the articles employed in barter, such as brass and tobacco, had been previously bought from the Company. Afterwards the privilege was withdrawn, and trade with natives and foreigners stringently prohibited. There were also restrictions

on the variety of crops they raised, and on their intercourse with the crews of ships visiting the port; and the value of imported goods they receeived on credit from the Company was secured by special mortgages upon their estates.

When the burghers, after expending their toil and labour on their lands, found that they were thus trammelled, and a fair price for their produce denied them, they naturally became discontented, and at length, in 1658, gave vent to their grievances in a petition signed by all the burghers and freemen, "no one excepted," with which they waited upon the Commander.

In this petition they set forth that they became free on certain conditions, in order to support themselves by agriculture, and also to have free trade in cattle and with the Hottentots; but now after they had slaved on their lands, trade was forbidden them. That the cattle given them to work their lands, instead of being the best, were of the worst description—some being oxen no larger than mastiffs, and thin cadaverous-looking cows. They had reaped and thrashed, and brought in their harvest, but they wanted to know before delivering their corn what they were to get for it; their price was ten guilders per muid, and if they did not get their price they should not cultivate any land, and would bring back all the stores and cattle and everything they had in hand, for they did not work to be slaves of the Company nor to be ordered in their farming arrangements. They requested to be allowed to barter cattle freely: also to go on board the ships in the roadsteads without being prosecuted by the Fiscal. They further represented that they suffered damage and loss from the Hottentots, and that they were the defenders of the country; and they concluded, "We have too long been paid in words. We are not the slaves of the Company. We are the protectors of the land."*

To this, the Commander and Council replied by reading to them the papers and conditions they had signed when they became freemen—and particularly the condition that they would submit to all rules existing and still to be made by the Governor. Their threats to compel the Company to give a certain price for their corn, or to do one thing or another, were characterised as seditious and rebellious, and they were reminded that they had been fed and supported, and raised from a low condition, at great expense and under serious difficulties. That the Directors had already made the calculation that, as the burghers had the land for nothing, they could get on with less than six guilders per muid for corn; but the Commander hoped to get more for them, as he himself

* Of the 16 or 17 who signed the petition seven only made their marks: the signatures included those of Steven Jansen, Casper Branckman, Frans Gerrits, Herman Ramaguene, Jan Martens, Johannes Rietvleit, and Jacob Cloeten. Johannes Reitvleit was said to have written the petition,—"with too sharp a pen," says Van Riebeek.

was allowed to carry on agriculture, and like the burghers would like to get the highest price. They were further told that the Company had forbidden barter with the Hottentots, as it necessarily raised the price of cattle, and moreover by making expeditions inland they neglected their work on the farms, for which alone they had been made free.

The Commander added, that as regarded himself, he could overlook the matter; but in the threats they had offered against the Company, they had run their head against a wall, and he reminded them of the reply of Commander Goens to a previous memorial of the freemen—viz., those who would not cultivate for themselves would be compelled to do so for the Company, and other freemen were ready to take their grounds should it be confiscated by the rebellious conduct of the present owners. He therefore cautioned them to take care of what they were about, and hereafter "do their best with the plough and keep the threshing-floor warm."

When this reply and reprimand was read publicly in the Council-room to the petitioners, their representatives confessed their faults, and begged the Commander would not be too much offended, as they now found that he had all along been in their favour, and endeavoured to help them. They promised in the future to do their best. After these words, each received a bokaal, or goblet of wine, from the Commander. Peace and quiet were restored (says the chronicle), and every one went home with a smiling face, the one making merry with the other because every one had got his due.

Van Riebeek took credit to himself for having promptly reduced the burghers to subjection and due submission. Writing to the Chamber of Seventeen, he says:—"We trust it may afford you satisfaction, and be worth the perusal, to see how quickly we made them hide their heads and submit to the orders issued and to be issued by your Honours, in accordance with their letters of freedom and with their freeholds."

How the matter was regarded by the Chamber may be inferred from their despatch in reply: "We have carefully examined the substance of the petition presented to you by the freemen and burghers, which we find to be full of sedition and mutiny; you ought not to have received it, but torn it up and thrown it away in their presence; and we hereby warn them not to present or transmit such papers in future, otherwise we shall be compelled to provide against the same by severe measures." At the same time it was intimated that the freemen should be somewhat assisted, in particular at the outset, so that they might be able to maintain themselves, and not acquire a distaste for labour; and, further, that care should be taken that every contract entered

into, and every promise made them, should be observed and fulfilled. It is noticeable that in the expressed aims and intentions of the Company there was much that appears good and beneficial; yet, practically, in all that affected the encouragement or even the toleration of free trade or industry amongst its subjects, everything was held secondary to immediate profit.

After nearly eleven years of service, Van Riebeek was rewarded by promotion to the Eastern possessions of the Dutch East India Company. The main object for which he had laboured was successfully accomplished. He had converted the Cape from a barren waste into a desirable place for the refreshment of the out-ward and homeward bound fleets. Thirty-two tons of grain, the produce of one harvest, were stored in the granaries, and cattle were regularly supplied by the Hottentots with whom he was in amity. His zeal, industry and devotion to the Company were acknowledged by his appointment to the government of Malacca, and he afterwards filled the office of Secretary to the Council of Batavia. His son, born at the Cape in 1653, rose to the high position of Governor-General of the Dutch East Indies.

Among the Commanders who succeeded van Riebeek, the most able and conspicuously active was Simon Van der Stell, who was Governor from 1679 to 1699. Immediately upon his arrival, he made excursions into the country, and established a government farm (now in the possession of the Theunissen family at Hottentots Holland), and laid out a village on the Eerste River at Stellenbosch, and new farms on the Dwars River at Drakenstein. By this time the number of colonial burghers had considerably increased, new men (Germans, Danes, Flemings and Dutch) taking their discharge year after year, to try their fortune as colonial proprietors. Including the Company's servants and the burghers with their wives and children, the European population in 1680 amounted to about six hundred souls. In Table Valley and about the Castle there were thirty families, chiefly subsisting by lodging houses or taverns and keeping gardens and a few cattle. From Table Valley to Steenberg, there were twenty-four houses, the owners subsisting by farms and vineyards. In Stellenbosch there were ninety-nine families, all betaking themselves to farming.

Van der Stell did not rest satisfied with the Cape being a mere refreshment station, and urged that something more should be made of the country, as there was land of excellent character in abundance awaiting labourers to till it. "The Colony is now," he wrote, "by God's blessing, brought so far that we have weathered the Cape of want of bread, wine, beer, flesh, fish, fruit and vegetables; and as our colonists chiefly consist of strong, gallant and industrious bachelors, who for the solace of their cares and for

managing of domestic concerns would most gladly be married; and as such bonds would establish the Colony on an immovable basis, we request that thirty or forty respectable young women be sent out, all of whom will be well disposed of in this place." The Directors of the Company received the suggestion for an extension of the Colony very favourably. They considered that the enlargement of the Cape settlement might eventually afford the Company, as sovereigns and patrons of the territory, a revenue for the payment and maintenance of their garrisons. They therefore determined to comply with Van der Stell's requisition as regards the young women, and also to reinforce the Colony with a number of settlers of the agricultural class.

It happened that Holland at this time was receiving with sympathy and kindness the Protestant refugees who were driven from France on the Revocation of the Edict of Nantes. The East India Company offered these "exiles for conscience sake" a home in their African possessions, and a number of them, amounting in all to about three hundred men, women and children, accepted the offer. In 1687 the Chambers of Amsterdam and of Delft informed Van der Stell that in addition to other freemen, some French and Piedmontese refugees were willing to emigrate to the Cape. "Among them," says the despatch, "are persons who understand the culture of the vine, who will in time be able to benefit the Company and themselves. We consider that as these people know how to manage with very little, they will without difficulty be able to accommodate themselves to their work at the Cape, also especially as they feel themselves safe under a mild Government and freed from the persecution which they suffered. It will be your duty, as they are destitute of everything, on their arrival to furnish them with what they may require for their subsistence, until they are settled and can earn their own livelihood. Further you will have to deal with them, as we have on former occasions directed you to do, in regard to freemen of our nation."

These refugees arrived in the Colony in 1688 and 1689; and the public records contain a register of the names of nearly all of them. Among them are those of Du Plessis, Malherbe, Rosseau, Fouche, De Villiers, Du Toit, Malan, Marais, Jourdan, Mesnard, Du Pré, Notier, Le Febre, Cordier, Retief, Theron, Hugo, Joubert, Le Roux, La Grange, Labuscagne and others, whose descendants are now widely scattered over the whole of South Africa.

The greater number of them upon their arrival, were placed on the lands along the Berg River Valley, where they soon taught the waste to yield them daily bread, and within a few years became a self-supporting community. Besides cultivating "the

cornfields green and sunny vines," with which they had been familiar from childhood, they planted French names throughout the district; and the titles of such estates as Le Parais, Lamotte, Cabrier, Normandy, Rhone, Champagne, Languedoc, and the like, which frequently occur in the neighbourhood of the Paarl, Fransche Hoek (La Petite Rochelle), Stellenbosch, and Wellington, remain memorials of the localities where they fixed their abodes.

A Minister of the Walloon Church, the Rev. Pierre Simond, accompanied and remained with them for a few years, holding religious sevices for them in the French language, on alternate Sundays at Stellenbosch and Drakenstein. An application to be permitted to form their own congregation at the latter place, and to elect their Vestry, was sternly refused them by Van der Stell. They were only for a very short time permitted to exercise their worship apart and unconnected with the Dutch Reformed Church, and were soon after, as Calvinists, merged in it and placed on the same footing, the authorities not allowing, for nearly a century afterwards, the least semblance of any other ecclesiastical establishment or worship in the settlement.

The refugees also endeavoured to preserve their language, and taught it to their children; but this was discouraged by order of the Company, who directed that "French should, in time, entirely die out, and nothing but Dutch should be taught to the young to read and write." In 1709, the use of French in addressing the Government upon official matters was publicly prohibited; and in 1724, the reading of the lessons at the church service in the French language took place for the last time.

The French astronomer, the Abbé la Caille, who visited the Cape in 1752, refers in his "Journal," to the condition of his fellow-countrymen, and notes the gradual extinction of the language amongst their children. He says—"With respect to the refugees, they have preserved the French language and have taught it to their children; but the latter, partly because they trade with the Dutch and Germans who speak the Dutch language, and have married or become connected with the Dutch and Germans, have not taught French to their children. There are no longer any of the old refugees of 1680 to 1690 at the Cape, only their children remain who speak French, and they are very old. I did not meet any person under forty years of age who spoke French, unless he had just arrived from France. I cannot, however, be sure that this is altogether general; but I have heard those who speak French say that in twenty years there would not be any one in Drakenstein who would know how to speak it." Le Vaillant, the French naturalist, who visited the Colony in 1780, states that he found but one old man who understood French. Before the close of last century, the language had quite ceased to be spoken.

In 1699 Simon van der Stell retired from office to live upon the wine farm which he himself had laid out and planted,—the celebrated estate of Constantia. He was succeeded, as Governor, by his son, William Adrian van der Stell, who during the five years of his administration appears to have abused the privileges of his position in such a manner as to create grievous discontent among the burghers. The main cause of this discontent was that he "attempted to play the master over all," and it was charged against him that he had, in an underhand manner, enriched himself by barter with the natives, and acquired an immoderately large estate at Hottentots Holland where he employed the Company's slaves for his own interests. Corn farmers complained that when they delivered the tenth of their produce as a tax at the Company's store, he compelled them to load their wagons on returning with requisites for his farm ; and that in the name of his brother and other friends, he furnished the Company's magazine with large quantities of wheat at higher prices than he paid the farmers. Wine farmers complained that they had to deliver their vintage at ten to twenty rix-dollars per leaguer, while it was sold to ship captains at 150 rix-dollars. Grantees of land, who wanted their title-deeds, said they could not obtain them unless the solicitation was accompanied with the necessary *douceur*, "for the Governor listened readily to reasons that jingle." Coupled with these charges against the Governor, there were complaints against his brother and other functionaries, including the second officer Samuel Elzevier, and the clergyman Petrus Kalden, who it was said "occupied himself far more with agricultural operations than with the pulpit."

A memorial setting forth these complaints was signed by sixty-one burghers and secretly conveyed by one of the outward-bound ships to the Government at Batavia. When Van der Stell received intelligence of this from Java, he was furious, and commenced a course of persecution against all whom he suspected of being disaffected. Amongst them were several of the refugees. Some secreted themselves in the inland parts of the country until the storm blew over. Others were seized, banished to Robben Island, Mauritius, Batavia, or ordered to Holland in the return ships.

Three of the burghers thus expelled, Messrs. Van der Byl, Hussing, and Van der Heiden, on their arrival in Holland were instrumental in obtaining attention to the case of the colonists, and at length secured the recall of the Governor.

In 1707, the Chamber of Seventeen wrote :—"We have had the dissatisfaction to perceive that grave commotions and differences exist between a great number of the colonists and the Cape Government. Much paper hath been covered with complaints and refutations which have occupied much of our time and given us much

trouble. Of all this we say no more than that we expect that such like matters will not again arise; and for the conservation of the public peace and for other good reasons, we have resolved and do now order that the Governor W. A. van der Stell, Samuel Elzevier, as well as the clergyman Petrus Kalden and the Landdrost Johan Starreberg, shall be removed and sent hither, retaining their rank and pay, but without any authority or office." At the same time a new Governor (Van Assenberg) was appointed, and it was announced that "all the colonists sent away and detained on the ground of alleged conspiracy and rebellion are restored to their former position and honours." This, as the despatch set forth, was done for the restoration of tranquillity, but no change whatever was made in the policy of the Company, which was avowed to be the enrichment of itself and not of the colonists.

The history of the country under the Dutch East India Company's rule during the remaining portion of the eighteenth century, shews that there was a continuous but vain struggle on the part of the free burghers to obtain some relaxation of the capricious and oppressive enactments of the Government, which not only excluded them from participation in foreign trade, but hampered them in all their transactions.

In 1719, representations were made to the Directors that, unless some alteration of the system was conceded, the inhabitants would no longer be able to find subsistence, and would be compelled to ask the Company to take them back again into their service. The concession they prayed for was the liberty of free trade along the coast, and to Sofala, Mozambique, and Madagascar. By means of such trade, it was urged, the poor inhabitants, who were only versed in agriculture, would find a living in the various occupations connected with navigation; the corn, wine and other produce raised in the Colony might with greater convenience and profit be sold; and, if the coast traffic were to succeed, a good lot of merchandize would be bought from the Company to traffic with, so that the latter would also be greatly benefited. To gain this object, they added that they would be prepared to pay a reasonable import and export duty.

Foreign trade in any form, except in their own hands, was not acceptable to the East India Company, and the application of the burghers met with no favourable response. They were assured, however, that the Company would receive all the produce they could deliver so long as there was sufficient consumption, and that the surplus of such articles as the Company did not need might be sold by the owners to foreign ships in Table Bay upon the payment of a small duty in the shape of a fee or perquisite to a high judicial functionary—the Fiscal. This privilege gave some impulse to production on the occasional arrival of foreign shipping,

and when the French and English fleets victualled there, the period was considered "the golden age of the Cape." There was an increased consumption of produce, and the facility of earning and obtaining money enabled the residents in and around Cape Town to enlarge their houses and extend their farming operations. But when, in consequence of European wars, foreign fleets no longer touched at Table Bay, the colonists again keenly felt the want of a market, and were reduced to an impoverished state by the absence of such an outlet.

In most of the Company's possessions, and especially at Batavia, at this time, distinctions of precedency and rank were punctiliously attended to. When the Governor rode out, every one meeting him had to pay him homage, and persons happening to be in a carriage must stop and get out of it till the Governor rode by. When His Excellency entered church, all persons, both men and women, stood up in token of respect; and his lady received the same honours. Likewise, when a member of the Council of Policy, or his lady, entered church, all the men stood up in the same manner as for the Governor, but the women remained sitting. Some of these regulations were adopted at the Cape; and in the days of William Adrian van der Stell, in 1705, a septuagenarian burgher, named Rotterdam, was publicly threatened with expulsion from the Colony for not standing up in church on the entrance of the Governor.

Not only at church and other public gatherings and assemblies, but also in private intercourse, every individual was as stiff and formal and as keenly alive to any infraction of his privilege as if his happiness or misery depended upon it. The ladies too were particularly prone to insist upon every prerogative attached to the position of their husbands, and the records of the Council gravely chronicle the decisions come to, on the complaint of high officials as to the places given to their wives' chairs in church.

Governor Ryk van Tulbagh, in addition to those rules, promulgated, in 1755, certain sumptuary laws, entering into detail as to the rank of those who should or should not use umbrellas, or wear silk dresses, embroidery, or other ornaments; the number of servants and horses that each rank might have; the costume of the coachman and footmen; the dresses of brides and their friends at wedding ceremonies; even the style of mourning and of burial, in case of death,—all were minutely laid down, and larger or smaller fines were the penalties attached to the infraction of these regulations.

Many of the inhabitants, unable to endure the system of government and the monopoly of the market which prevailed, moved away from the neighbourhood of the Company's garrison. They crossed the mountain ranges and passed into the inland

plains, where they obtained a subsistence by imitating the native mode of life, killing game and depasturing cattle. Others soon followed their example. The authorities, although at first opposed to the movement, after a time discovered it to be of some advantage, inasmuch as it "would add to their revenue, and increase the food supplies of the settlement." In 1705, they give their formal sanction to the extension of the territory by issuing "loan leases," or revocable squatting licences, to such as preferred a request for them, but always subject to the condition of resumption of the property at any time by the Company. Wherever there was vacant or disposable land, whoever chose to do so might apply for it; and if after temporary occupation, he found difficulty in securing permanent waters, or in grazing his cattle, he immediately enlarged his range, and moved further into the interior. It was in this manner that the early Cape "Boers" or farmers adopted the nomad habit of "trekking," which has been continued by their descendants along the border of the European settlements until the present time.

The dispersion of the European population, however, was in many ways detrimental alike to themselves and their descendants. In the inland districts, then designated "Overberg" (beyond the mountains), they were confined to an isolated world of their own, where any energy or industry was cramped by the obstacles of travel to, or the impossibility of getting, a market for their produce, and they and their children were compelled to endure an unprogressive mode of existence, without any available means of advancement. Among them for many months in the year, bread was a luxury scarcely attainable,—*biltong*, the dried flesh of game or oxen, taking its place. Rarely could they gladden their hearts with a glass of wine. The most wealthy farmer was considered as well-dressed in a jacket of cloth, breeches of undressed leather, woollen stockings, a cotton handkerchief about his neck, a coarse calico shirt, Hottentot veldt-schoen, or else leather shoes with brass buckles, and a coarse hat. A plain close cap, and a coarse cotton gown, virtue, and good house-wifery were looked upon by the fair sex as sufficient adornments for their person. They had neither church nor school within one or two hundred miles of them; but every morning and evening the patriarch of the family offered up prayer and praise, and read from the cherished family Bible, whose simple teachings served to maintain the principles as well as the forms of morality and civilization amongst them.

Governor-General Imhoff, who touched at the Cape in 1743, reported that the state of the farmers in the remote districts was most lamentable, and he represented that if their children were further neglected they would lapse into barbarians. As a remedy,

a magistracy and church were established at Swellendam in 1745, the Gamtoos River being then declared the farthest limit of the settlement. But when the colonists spread to the Bruintjes Hoogte, Camdeboo, and the Sneeuwberg mountains, a magistracy was established in 1786, at Graaff-Reinet "to prevent hostilities with the natives, and any foreign power settling at Algoa Bay;" and the Great Fish River was proclaimed as the territorial boundary of the Company's prosessions.

Although measures had, from time to time, been taken to confine the inhabitants within the limits of the old districts, the Government were never really able to control or restrain them. From the Castle at Cape Town proclamations and placaats were issued forbidding any burgher to leave his loan-farm, without permission, on any pretext whatever, "or to proceed into the interior on pain of corporal or capital punishment, aye, even to the death, and the confiscation of all property." But these orders were treated with indifference and contempt, and the border farmers moved from one place to another as their fancy led them, some as elephant hunters crossing the boundary after the large game, and others as "togt-gangers" or traders, bartering goods with the natives around or beyond them. Under these circumstances, collisions and conflicts with the native races were inevitable.

Within one or two hundred miles of the capital, the early pioneers found excellent tracts of land unoccupied, except by remnants of the weak and scattered Hottentot tribes,—the Khoi Khoin, or "men of men" as they termed themselves,—who peaceably accepted service with them in return for food and protection. But the colonists passing further inward, through the Karoo plains, encountered the hostility of the Bushmen, who were widely spread over the country from the Nieuwveldt and Camdeboo mountains to the Orange River. The white man destroyed their game, and they retaliated by taking the white man's cattle. Then followed reprisals and acts of violence and revenge; and the miseries which fell to the lot of both colonists and aborigines at this time form one of the saddest pages in the annals of the country.

In the absence of military protection, the farmers, who almost from their youth were expert in the use of firearms, assembled for mutual defence, and proceeded in pursuit of depredators, or attacked those by whom they were threatened or disturbed. These armed assemblages were called "Commandoes," and the system was recognised by Government, who appointed a Field-Commandant to each district and a Field-cornet to each sub-division of a district. The Government, however, owing to its distance from the common scene of hostilities, and also from the want of a true knowledge of the state of things there, exercised but little control over them.

There was continual fighting with the Bushmen for nearly thirty years, apparently producing no other effect than to render them the implacable enemy of the white man, and finally resulting in what was virtually a war of extermination. The official records of Graaff-Reinet show that between 1786 and 1794, upwards of two hundred persons were murdered by the Bushmen, and that the number of the latter killed by "Commandoes" was not far short of two thousand five hundred.

Those of the pioneers advancing eastward encountered the formidable Kafirs of the Amakosa nation. Some of the latter had been, for years previously, steadily encroaching upon and conquering the Gonaqua Hottentots, westwards of the Great Kei River. About the time of their first conflict with the colonists, they appear to have been engaged in an intertribal war with their neighbours, the Ama-Tembus, by whom they were signally defeated, their chief Khahabe being killed and their cattle becoming the prize of the victors. Being impoverished by these losses, a considerable number of them crossed the Fish River and commenced plundering the Europeans, their mischief and rapacity being often accompanied by cruel murders. Amicable means were tried to induce them to retire, but without success. The border inhabitants then determined to do themselves justice by the law of force. They assembled a Commando, under Commandant van Jansveld, and successfully repulsed the Kafirs in several actions, capturing 5,300 head of their cattle, a good portion of which was recognised as cattle stolen from the colonists. This, the first rupture between the two races, took place in 1781 and 1782. Afterwards it was agreed between some Chiefs of the tribes and Governor Van Plettenberg, on his journey to the interior in 1778, that in order to avoid all disputes in the future, the Fish River from its source to the sea should be mutually recognised as the boundary between the Kafirs and the European inhabitants.

In the meantime, the struggle between England and her American Colonies had been some time in progress, and Holland became allied with France and the armed Neutrality Powers, and an active enemy against England. In 1780, war with Holland was declared, and the British Government planned an expedition in the following year to seize the Cape of Good Hope. This intention became known through a spy named De la Motte, and a French fleet, under Admiral Suffren, was without delay despatched for the protection of the Dutch Company's possessions at the Cape. On its way out, off the Cape Verde islands, it accidentally met with the fleet of English ships of war, under Commodore Johnstone, equipped for the capture of the Cape. After a severe engagement, in which the English ships were more or less disabled for a time, the

French Admiral pursued his way to Simon's Bay, where he landed his troops, some two or three thousand in number. The presence of this force preserved Cape Town against any attack upon the part of the English fleet, and at the same time prevented the colonists from attempting to imitate the conduct of the Americans in their struggle for independence.

During the war, however supplies of specie from Holland were stopped, and to meet the exigencies of the Government a colonial paper currency, was thrown into circulation by Governor Van Plettenberg to the amount of nearly one million rix-dollars (then of the value of four shillings each), with a promise that the same would be redeemed at par on the arrival of ships from Fatherland. On the resumption of peace in 1783, this pledge was only partially fulfilled. When the French troops took their departure, the defects of the monopolising system under which the settlement had grown up were again keenly felt, and discontent generally prevailed amongst the burghers.

Two or three years before (in 1779), they had sent to Holland four delegates—Messrs. Jacob van Reenen, Barend J. Artoys, Tielman Roos, and N. G. Heyns,—with a list of accusations against Governor Plettenberg and other functionaries, and a petition for redress of their grievances. They complained of the corruption and exactions of the officials of the Company; and of the arbitrary power exercised by the Governor and the independent fiscal Boers, especially in the compulsory removal from the Colony of persons whom they thought fit to designate as "useless" or "dangerous" subjects. They asked for a reform of the Court of Justice, for a definition of burgher rights and privileges, and for the establishment of a printing press, or at least, that the members of the community should be able to obtain copies of the laws in force. And, as in every previous petition, they prayed for the concession of a limited export trade.

Some of these demands were met, and regulations promulgated to check the abuses on the part of officials which were complained of. But, with regard to the aspirations for civil and commercial privileges, the petitioners were reminded that they had been only permitted "as a matter of grace to have a residence in the land" and gain a livelihood as tillers of the earth, and that the settlement was planted not for their commercial advantage, but for the welfare of the Company.

This did not serve to allay the dissatisfaction so generally prevalent, and in 1785 other delegates, named Redlinghuys, Bergh, Roos, and Bresler were sent to Holland, to obtain, if possible, redress from the Company, and failing in that to appeal to the States-General of the Provinces, for a reform of the evils which were at the root of the Company's unpopularity. The burghers

in their memorial demanded the right to sell their produce to whoever they chose—"that all that commerce introduces into the country shall be freely landed, and all that the country produces shall be freely exported; it being an established rule that the farmer cannot maintain himself without a sufficient vent for whatever his labour may produce from the land; and a Colony like this, composed of farmers alone, can have no durable means of supporting itself without a steady demand for produce proportioned to its quantity; nor without facilitating internal communiation as much as possible, as the difficulties of transport must otherwise neutralise all the efforts of the farmers by diminishing their profits."

The long-continued prosperity of the Dutch East India Company was at this period on the decline. Its finances were in confusion, and there were complaints of misgovernment in other of its possessions besides the Cape of Good Hope. The Stadtholder of the Netherlands, in 1791, appointed two Commissioners, Messrs. Nederberg and Frekenius, to inquire into the affairs of all the settlements. On their arrival at the Cape in 1793, there was great expectation of the redress of abuses, and of reform in the system of administration; but nothing was immediately done, excepting establishing a bank of loans (called the Lombard Bank), to assist the inhabitants by enabling them to get advances on mortage bonds and other securities. They also issued a proclamation warning the inhabitants not to live beyond their means, and not to keep costly equipages and establishments; but to cultivate silk, wool, cotton, oil, wax, and indigo. They then proceeded on to Batavia, leaving the Cape in charge of Commissary-General Sluysken and the chief officers of the Company as a Council of Regency.

Internal troubles had meanwhile been accumulating. In the border districts, the absence of any power of control on the part of the Government produced its natural effect upon the colonists—evoking a restless independence, which resented any mandate or interference on the part of the authorities. Hostilities between the colonists and Kafirs were frequent; and it was charged against the former, by the first magistrate placed at Graaff-Reinet, that these disturbances were stimulated by covetousness for their neighbour's cattle. The Government instructed their officers to inculcate amongst them principles of humanity and the policy of living in harmony with the Kafir tribes; but that course was characterised "as working the destruction of the land," and disturbances rose to such a height that the authorities found themselves under the necessity of giving their sanction to "Commandoes" as before. Afterwards, when called upon to contribute their share of the taxes for the support of Government, the border men of Graaff-Reinet repudiated their obligation to pay anything "for places

which they had been obliged to defend at their own expense." They at the same time complained of the restrictions on the sale of their produce, and the inconvenience and loss occasioned to them by the depreciation of the paper currency, which it had been promised would have been redeemed after the arrival of ships from Holland, but of which a considerable amount was still in circulation.*

Several disbanded soldiers had prior to this been allowed to settle in the country, and almost every Boer of any consideration had one of them employed as a schoolmaster to his children. Those men diffused the principles of Jacobinism and Republicanism, which at this time had spread even to the Cape. Parties of what were termed "Loyalists" and "Nationalists" were organized, and "Liberty, equality and fraternity" became a cry even in the remote country districts. The proceedings of these parties —although very ridiculous—were then considered very formidable, simply because of the weakness of the Government, which had no garrison outside of Cape Town to support its authority.

At length, on the 6th of February, 1795, the inhabitants of Swellendam and Graaff-Reinet assembled in arms, and made—as they termed it—"a revolution"; expelling the Magistrates from their offices; and declaring themselves "unwilling to obey the Dutch East India Company any longer; and that they would be independent."

A general spirit of disaffection against the Company's rule existed throughout the length and breadth of the land; but at this very juncture, when the disagreement between the people and the Government threatened the tranquillity of the country, an unexpected solution of the internal difficulty was brought about by the course of political events in Europe.

The occupation of Holland by the French Revolutionists made the Prince of Orange (the Stadtholder) a refugee in England; and the English Government, with the concurrence of the Prince, sent out a fleet and troops under Admiral Elphinstone and Generals Clarke and Craig, who forcibly took possession of the Colony in the name of His Majesty the King of Great Britain on the 16th September, 1795.

An effort for the recapture of the Cape was made in the following year, but the Dutch squadron, which was fitted out for the purpose, numbering nine vessels of war, with 342 guns and 2,000 troops, under command of Rear-Admiral Lucas, was captured by Admiral Elphinstone, without any resistance, in the harbour of Saldanha Bay in August, 1796.

At the peace of Amiens, the Cape of Good Hope was again

* By a proclamation of April, 1790, a fine of 1,000 rix-dollars was imposed on persons who would not accept the Government paper money, except at a discount of 8 to 10 per cent.

restored to Holland, in 1803; but the East India Company was then replaced by the Batavian Republic, who sent out, as their representatives to the Colony, the Governor-General Janssen and Commissioner-General De Mist, who at once set about establishing a new and efficient administration upon just and liberal principles—"no longer dependent upon any commercial body," but such as might tend to reconcile the burghers who had rebelled against the unpopular Company, and soothe the continued animosities between them and the Aborigines.

Scarcely three years had passed, however, when the sovereignty of the country was changed once more. On the renewal of the war in Europe, England determined upon the recapture of the Cape of Good Hope, and sent out a well-appointed force under General Sir David Baird. After a brief but honourable struggle, Governor-General Janssen, on the 19th January, 1806, surrendered the Colony, his troops being embarked and sent to Holland by the English Government.

At the peace which followed, in 1815, the King of the Netherlands, by convention, and in consideration of a payment of between two and three millions sterling, towards the settlement of the Low Countries, finally ceded the Cape, along with other possessions, in perpetuity to the British Crown.

TEMPORARY OCCUPATION BY GREAT BRITAIN.

From 1795 to 1803, the British Government held the Cape temporarily as a possession by conquest. Their principal reason for doing so was its importance as a military station, and its being considered the key to India and the East, which the leading naval power of the world must hold possession of in all contingencies. A considerable armed force was maintained at Cape Town, defensive works were constructed, and there was a liberal expenditure of money. In the seven years of their occupancy it was estimated that more than a million and a half sterling of English money was spent in the Colony, whose exports at that time did not exceed £15,000 per annum, and whose European population af all ages and sexes was not above 25,000 in number.

By the terms of capitulation, the inhabitants were guaranteed the preservation of all the prerogatives they enjoyed, and the protection of all private property, whether belonging to individuals, churches, orphans or public institutions; the free exercise of their public worship without alteration; that no new taxes should be introduced, and those existing should be modified as much as possible in consideration of the decay of the Colony; and that the paper currency then in existence should be continued at its then current value, and all the lands and houses, the property of the Dutch East India Company, taken over by the new Government were bound security for the paper-money in circulation.

The British Commanders, Elphinstone and Craig, adopted every measure calculated to promote the prosperity of the settlement. They at once announced that the monopolies and restrictions on the internal trade of the Colony, hitherto in force for the benefit of the Dutch East India Company, were now at an end; that internal trade was entirely free and unrestricted; that every person might sell his produce to whom, and in what manner, he pleased, as best suited his interests; and that all inhabitants so disposed were at liberty to exercise any trade or profession which might suit their inclination; that the navigation of the coast from harbour to harbour was also free, and that there existed no restraint in regard to the possession of boats or vessels of any sort by which the produce of any part of the Colony might be conveyed to a market.

Major-General Craig assumed the reins of Government for a year or two, until the arrival of his successor, Earl Macartney, who as a civilian of high rank and character was chosen for the office of Governor. He endeavoured to soften the national feelings and

prejudices of the inhabitants by a conciliatory and enlightened policy, dealing kindly and liberally with individuals who had sustained losses by the change of sovereignty of the country; retaining in office many of the former functionaries, and largely employing colonial-born persons in places of trust in the administration. Among other reforms he took steps for putting an end to the practice of proceeding by torture against persons suspected of crime, and of punishment after conviction by breaking on the wheel. Capital punishment—especially of slaves and natives—was, according to the Dutch law, carried out by the executioner, who, in the terms of the sentence, had to see that the criminals were "bound to a cross and broken thereon alive, from under upwards with the *coup de grace*"; or laid upon a wheel or hung on the gallows, "there to remain a prey to the air and the birds of the heavens." Reports from the Courts of Justice relative to the subject were obtained by Craig, who urged upon the Home Government to authorise a stop being put to the inhuman procedure. In the Commission issued to his successor, Earl Macartney, the necessary instruction was given by the King's command. The racks, wheels, and other instruments of torture were destroyed, and for capital crimes the cord was made the instrument of death as in England.

Earl Macartney's governorship only extended over twelve months. In accepting office he made it a condition that should his health give way he would be authorised to transfer his duties to the officer next in command, Lieut.-General Francis Dundas. The emoluments allowed the Governor at this time were a salary of £10,000 per annum and £2,000 table money; the Secretary to the Governor received £3,000; and it was provided that in case the revenue of the Colony fell short of the cost of the establishments, the deficiency was to be made up by the Home Government.

Before his departure, Earl Macartney proclaimed the boundary of the Colony to be, on the eastern frontier, the Great Fish River, on the north the Zekoe River, behind the Sneeuwberg, and the Caree or Roodeberg behind Camdeboo; and the Zak River, the Roggeveld and the Hantam, forming a semi-circle from the east to the western limits, the Koussie River. He also issued a proclamation with regard to commerce and navigation. When the settlement was under the Dutch East India Company, it ws usual to admit vessels of countries in amity with Holland into the ports; so now it was announced that British ships, or those of countries in amity with Great Britain only were permitted to do the same, and to import or export free of any duty; but no goods from the East could be imported except by English East India Company's vessels.

Sir George Yonge was sent out as successor to Macartney, but his term of office was also of short duration. During it, however,

a printing press was established for the first time—Messrs. Walker and Robinson being authorised to this effect by Proclamation of 1st July, 1800; but the privilege was accompanied with the condition that no paper, book or pamphlet was to be put to press until the same had been approved by the Government.

Much discontent prevailed during Sir George Yonge's administration, and many complaints having reached England, he was suddenly and unexpectedly recalled, and a Commission appointed to enquire into the abuses charged against his government.

The first of his acts, which gave a great degree of offence and dissatisfaction, was the shutting up of the public gardens in Cape Town. This happened almost immediately after his arrival in the Colony, and at a season of the year (the middle of summer), when the inhabitants were accustomed to enjoy the refreshing coolness of the shady walks—then the only avenues of the kind in the vicinity of the town. In consequence of complaints, an order was issued by the Governor stating that his object was to put the avenues in repair, and all respectable persons were permitted to enter on writing down their names at the entrance-gate; but very few would accept as an indulgence what they had always considered as a right.

Another matter complained of was that, in direct violation of the articles of Capitulation, which expressly stated that no new taxes would be imposed, the Governor had augmented those already established by issuing proclamations requiring licences to be taken out for keeping billiard tables, holding clubs or societies, and for the killing of game. The regulations respecting licences for billiard tables and clubs were considered to be of little harm, as they tended to check disorderly meetings, gambling, and dissipation, and were meant also to suppress Jacobin gatherings; but the laws enforced with regard to the killing of game, and the taking out of an annual licence for that purpose, created very general discontent. At that time, game, both large and small, was so abundant in the colony, that the prohibition inflicted an injury on the farmers, especially those in the remote parts, many of them having been in the habit of killing game for the maintenance of their families, and others to protect their fields from destruction. The complaints on this point at length produced an amendment of the law on the 6th November, 1800, modifying the restrictions laid down.

The discontent occasioned by the foregoing acts was increased by a proclamation of the 14th August, 1800, imposing additional charges on colonial produce—brandy being increased from three to six rixdollars per leaguer, when brought into town: also by a proclamation ordering the establishment of the office of wine-taster, to which the Governor's own private secretary was appointed. It was further complained of that he attempted to grant in perpetuity

the public lands mortgaged for the paper currency, by giving a grant of land to Mr. Duckitt, who had been sent out by the Secretary of State as a model agriculturist, to teach and introduce improved modes of husbandry; the Burgher Senate (who had to report upon all alienations of ground) holding that so long as the Capitulation treaty was in force, Government had no power to alienate by permanent grant any of the lands mortgaged for the redemption of the paper currency circulating in the colony.

But there were other and graver charges, to the effect that the aide-de-camp, private secretary, and others around the Governor, were in the habit of exacting a part of the profits accruing to individuals, who obtained through their means certain privileges not granted in common—in other words, "for facilitating their affairs with the Government." The evidence before the Commission fully established the fact that a practice prevailed of taking *douceurs* or bribes for obtaining or granting certain privileges or contracts, although there was nothing whatever to show that the Governor was cognisant of or shared in these. The prevailing opinion (says the Commission appointed to examine into these abuses) was that the most effectual way of carrying a point with the Governor was by pecuniary offices to those about his person.

An instance of the depravity and profligacy of those immediately connected with the representative of the Sovereign, was given in the case of an official, who wanted one-half, but afterwards agreed to take one-third, of the profits on the importation of a cargo of slaves. A Mr. Hogan was one of those for whom this official "facilitated affairs." He had a vessel named the *Collector*, which he employed as a privateer; she was remarkable for the number of prize slave cargoes which she brought into port, having ostensibly captured them from prizes off the coast of Madagascar. But the Captain and officers of a Danish ship which arrived at the Cape while the *Collector* was in harbour, identified her as well known in the slave trade. They declared the *Collector* had never captured any prize, but that the slaves were purchased and put on board the vessel at Mozambique. This case was investigated by the Court of Justice, and it was proved that the Court of Vice-Admiralty had been grossly imposed upon by false witnesses and false log-books; and Hogan seems to have been the person who planned the whole of it. Sentence was given against the Captain of the *Collector*, who bore the name of Smart, but he fled the Colony, and was declared an outlaw.

Governor Yonge was exonerated from all knowledge of these affairs; but a despatch from Downing-street, dated 14th January, 1801, directed him to resign his government into the hands of Lieut-General Dundas, without waiting the arrival of Lord Glen-

burvie, who was appointed his successor, but who accepted the appointment of Paymaster to the Forces instead.

The condition of the country districts in the meanwhile called for the serious attention of each successive Governor. At Swellendam, after the capitulation, the former Landdrost, Mr. Faure, was reinstated; and the people received him to his satisfaction. At Graaff-Reinet the burghers were apprehensive that their conduct might be represented in a very bad light by some one or other of the old servants of the Company, and they addressed a communication to Governor Craig, setting forth the reasons of their discontent and their grievances; at the same time requesting that he would be pleased to appoint a proper magistrate over them; provide a clergyman to fill the vacant pulpit of their Church, and furnish the district with the necessary gunpowder and lead for its requirements.

It was deemed undesirable to re-appoint the former Landdrost, Mr. Maynier, to the magistracy, and one was selected for the office who was likely to be acceptable to the people. He was accompanied by a clergyman who was known to many of the inhabitants. On their arrival at Graaff-Reinet, they found there was no person disposed to come forward to take the oath of allegiance; but the people made a representation of their views, for the information of the Governor, setting forth that "they were willing to bring to Cape Town all their produce; that they would observe all reasonable orders and laws provided the Government furnished them with what the country was in want of; that they would not take the sword against the English, and that they only refused to take the oath, because when their High Mightinesses of the Netherlands should re-take the country they would not be able to justify themselves for so doing."

After a short stay, and finding themselves surrounded by an insubordinate people, who showed as little respect for the magistrate and clergyman as they did for what they termed the "aristocrats of the old Company," whom they had previously sent about their business,—the magistrate, Mr. Bresler, and the clergyman, the Rev. Mr. Manger, took their departure and returned to Cape Town.

General Craig ordered a military force into the country to subdue the burghers and to secure obedience to authority. But meanwhile a change came over the representatives of Graaff-Reinet. At a public meeting held in August, 1796, they resolved to throw themselves on the protection of the British, and submit to the order of the Governor. By this time Earl Macartney had arrived at Cape Town, and he sent Mr. Bresler back as Landdrost to Graaff-Reinet, accompanied by his own private secretary, Mr. Barrow—afterwards widely known as Sir John Barrow. They were amicably received by the inhabitants, and for a while peace and tranquillity was restored.

Two years afterwards, however, disturbances again occurred, which led to most unfortunate and disastrous results. The Court of Justice had issued a decree for the apprehension of Commandant Adrian van Jaarsveld, on a charge of falsifying a receipt with the object of defrauding the Orphan Chamber of an amount of arrear interest due on a mortgage on the building of his loan-place named "De Vreede" at the foot of the Nieuweld Mountains. He was arrested and sent from Graaff-Reinet to Cape Town in charge of four dragoons and the Secretary to the Landdrost. A short distance from Graaff-Reinet, the escort was met by an armed body of Boers, who rescued the prisoner. They then strengthened their number by summoning all the farmers between the Lange Kloof and Bushman's River to join them, under threat of being considered as "traitors to the country, who would be dealt with after the affair was over." The ringleaders and their followers took an oath to be faithful to each other to the last drop of their blood. The inhabitants of Bruintjes Hoogte were most prominent amongst them. The Sneeuwberg farmers appear to have kept aloof from the rising.

This force marched on Graaff-Reinet, and on arrival at the Sunday's River Drift, lay there encamped for about a month, prescribing rules how the Kafirs should be treated, and threatening to hang the Landdrost and exterminate the garrison, which consisted only of a sergeant and seven Dragoons. The new clergyman of Graaff-Reinet, the Rev. Mr. Ballot, repeatedly went out to interview the insurgents, and endeavoured to persuade them of their folly; and he succeeded so far as to retard their plans and prevent acts of personal violence. Meanwhile, news of the revolt having reached the authorities in Cape Town, the Acting Governor, General Dundas, at once dispatched two divisions of troops, one overland and the other by sea, to Algoa Bay, for the relief of Graaff-Reinet. Major McNab, with a detatchment of Dragoons and Hottentots, proceeded overland, and as it was known the insurgents had sent emissaries to induce the people to come to their assistance, along his route, he issued proclamations exhorting and ordering the inhabitants to remain quietly at their homes.

General Vandeleur had command of the troops landed at Algoa Bay. He at once proceeded inland, but met with no opposition on the road. On his arrival at Graaff-Reinet, he found that the insurgents had retired to Bruintjes Hoogte, and had sent in two of their number submissively applying for pardon. Vandeleur then followed them to Bruintjes Hoogte, where the people laid down their arms. The leaders, Marthinus Prinsloo, van Jaarsveld, and others, who were considered more culpable, were apprehended and sent on to Cape Town to await their trial, and the rest were pardoned on their paying a fine to Government

of one or two horses for the cavalry, according to their means. A few of them, who refused to surrender, retired as fugitives into Kafirland.

During these movements of the British troops, crowds of Hottentots flocked after them. Some came from their kraals; others availed themselves of the prevailing disturbances to abandon the service of the farmers, which they complained had been cruel and oppressive to them. When the insurgents surrendered, these Hottentots took advantage of the opportunity of possessing themselves of some of their weapons; but the general tranquillity of the country demanded their being disarmed, and this was accordingly done. Their disarmament made them suspicious of the intentions of the English towards them, and when, upon order being restored in the district, they saw the troops being withdrawn, they dreaded the probability of having to return to the service of the Boer masters from whom they had fled, and to whose anger and ill-will they feared they would fall a sacrifice. Some of them asked the authorities to point out some means for their subsistence, and to allot them certain unoccupied lands. Their appeal did not receive immediate attention; and, with characteristic imprudence and fickleness, a considerable number of them joined their barbarous neighbours, the Kafirs, who were then investing the bushy country from the Bushman's to the Sunday's River, and aggressively advancing on the Europeans. The Kafirs welcomed the Hottentot reinforcement to their side, as several of them were well accustomed to the use of firearms. Immediately upon this union, they set about plundering and burning the farmers' houses, in many cases murdering the defenceless inhabitants on the thresholds of their dwellings, and desolating the whole country from the Bushman's and Sunday's Rivers westward even to Langekloof and Knysna.

The border farmers were confounded by this unexpected insurrection of the Hottentots, and panic-stricken at their first successes. The confederacy was a formidable one, and consisted of seven hundred men who had already with them more than three hundred horses and one hundred and fifty fire-locks, and the Hottentots who still remained under the farmers were suspected of not being well disposed but rather inclined to join them on the first opportunity. A commando of burghers was formed under Commandant Tjart van der Walt, and a detachment of troops under Major Sherlock took the field, to suppress these plundering bands, the latter checking their advance westward at Langekloof. Unfortunately Van der Walt,—one who is described as "inspiring confidence into his own people and striking terror into his opponents,"—was struck down by a musket ball, when penetrating the woods near the Gamtoos River. Deprived, of his services, the Boer Commando broke up, without accomplishing any favourable result.

While the country districts were in this deplorable state, General Dundas sent for the former Landrost of Graaff-Reinet, Mr. Maynier, and commissioned him to use his efforts for the restoration of peace. Dundas, remembering the unfortunate events at San Domingo, Hayti, in 1791, feared the most serious consequences would follow from a war of races, if the anarchy which prevailed was not suppressed. He counselled that the Hottentots should be appeased by all fair means. The question was, how to enter into negotiations with them. Mr. Maynier tendered his services, and went unarmed into the territory between the Sunday's and Bushman's River, where the confederacy was assembled.

After much trouble, he concluded a peace with the Hottentots, the terms of which were "that Government should protect them against the ill-treatment of the Boers in the most efficacious manner, and should provide that when they served the Boers they should be well paid and well treated." He then returned to the General, bringing with him the principal chiefs of the confederacy, Klaas Stuurman, Boezak, and Bovelander, with whom the General ratified this peace. A similar plan was adopted with regard to the chiefs of the Kafirs, to whom presents were forwarded, and with whom the General also agreed on terms of peace.

Mr. Maynier was then appointed Resident Commissioner at Graaff-Reinet, charged with superintending and carrying out the regulations necessary to give effect to the agreement made with the Hottentots, and to restore order in the district. The plan he adopted was to open a register of the time, wages, and other terms upon which each Hottentot entered the service of any European master; so as, in case of dispute, reference could be had thereto as to their mutual engagements. He urged the farmers, now recovering from the panic and apprehension which had seized them, to return and take possession of their farms, as the only way of restoring confidence and tranquillity. But a state of unrest continued throughout the country owing to the circulation of mischievous reports, which were in many cases believed by the inhabitants, who were extremely credulous and easily imposed upon.

A number of Boers assembled in arms at Zwager's Hoek, as it was rumoured the Kafirs and Hottentots were preparing to extirpate the farmers at Bruintjes Hoogte. Their leaders, Commandant Rensburg and Field-cornet Erasmus, said they were unable to restrain the people at their places, and were obliged to go with them. They marched to Graaff-Reinet, where they requested ammunition and leave to go on commando; at the same time complaining of the privileges granted to the Hottentots, and especially their being permitted to use the Church, thus placing them on an equal footing with the Christians; and, finally, demanding that those Hottentots who had murdered their relations should be given up into their hands.

At this time, there were a large number of Hottentots in the town; many of them alarmed by the movements of the farmers, having fled from their kraals, or from their masters' service, to the Drostdy for protection. They were received and provided for by the Commissioner, as a temporary measure, it being considered prudent to have them under supervision and control there, lest they might form roaming bands and renew the system of plunder and depredation which had previously prevailed. The Commissioner, parleying with the insurgents, consented that the Hottentots should be kept out of the Church, where the Missionary Dr. Van der Kemp had been ministering to them, and that the use of that building should be left entirely to the Europeans; that such of the Hottentots as were accused of murder should be arrested and tried according to the laws of the country, but not delivered into the hands of their accusers without any proof of their crimes. A small body of dragoons, with four field pieces, in addition to the Hottentots, were prepared to defend the town; the other inhabitants having laid down their arms, refusing to use them against their countrymen. The insurgents threatened that if the Hottentots were not delivered up, they would destroy the place. The Commissioner received this challenge with firmness, and after their refusal to lay down arms, or retire, opened fire upon them. The fire was returned on the side of Van Rensburg and his party, and was continued from morning until sunset, but they at length retired and dispersed to their farms, without subduing the Drostdy, and happily even without any bloodshed on either side.

Mr. Maynier continued his efforts to restore order, and endeavoured to get the Hottentots to enter, for the second time, into the service of their masters; but his firmness and occasional severity in carrying out his plans, in conformity with the principles he had laid down, made him exceedingly unpopular with the farmers. Reports to his discredit were circulated all over the country; amongst others, that one of the best and most respectable of the inhabitants of the Camdeboo, a Mr. Naude, had been cruelly murdered by a band of Kafirs, and that he had in some way connived at this atrocity.

The general dissatisfaction amongst the Graaff-Reinet colonists was such as to force General Dundas, much against his will, to recall Mr. Maynier; and upon the return of the latter to Cape Town, a commission was appointed by the Government to enquire into the accusations brought against him. These charges were:— Delaying to acquaint the Government with the turbulent state of the country; obtaining cattle from the Kafirs and Hottentots for beads and other trifles, inadequate to their value; sending emissaries among the Hottentots to dissuade them from entering the British service; refusing to bring certain Hottentots to

Graaff-Reinet accused of murder, and permitting them with impunity to escape; injustice and cruelty in the matter of the murder of Naude, and also in delivering into the hands of the Boers a number of Hottentots who fled to him for protection. The Commission, after a lengthened investigation, reported that Mr. Maynier was "entirely innocent of all and every of the charges preferred against him, and that some of the evidence was such as to merit the most serious reprobation." He was at once re-appointed to office, as a member of the Court of Justice.

Meanwhile, an intimation of the probable early restoration of the Cape to the Dutch Government reached the Colony; and the Governor, General Francis Dundas, made arrangements for the termination of his administration. He shewed a generous intention towards the Hottentots who had taken refuge at Graaff-Reinet and were indisposed to re-enter the service of their former masters. He proposed to the Rev. Dr. Van der Kemp to locate them, under his charge, on a farm-place near Algoa Bay, where they would have the protection of the Military detachment stationed at Fort Frederick. The proposal was accepted, and Van der Kemp left Graaff-Reinet with 300 Hottentots, men, women, and children, and founded the mission institution of Bethelsdorp, which became an asylum for numbers of the race who left their kraals and hiding-places in the woods, and settled down as peaceful subjects.

The Boer prisoners who had surrendered to General Vandeleur in 1799, had been all this time in custody within the Castle of Cape Town. Their trial took place in 1800, before the Court of Justice, consisting of Messrs. O. G. de Wet, A. Fleck, C. Matthiessen, H. A. Truter, J. P. Baumgardt and J. A. Truter, Secretary. The leaders, Prinsloo and Van Jaarsveld, were condemned to death; others were ordered "to be delivered to the executioner blind-folded, and having kneeled down upon a heap of sand, to have the sword waved over their head for punishment, and then to be banished for the remainder of their lives from the settlement;" and some were recommended to mercy and set at liberty. Owing to the change of Governors, and the disturbances in the country, the execution of the sentence of the Court of Justice was postponed from time to time; and Governor Dundas, in December, 1801, recommended that, in consideration of these circumstances, clemency should be shewn to the prisoners by some modification of the capital part of their punishment, if not by a full remission of their sentence, "thereby demonstrating the mild spirit of the English, and the placable forbearing system actuating the Government." Shortly after this, information of the Treaty of Amiens, restoring the Cape to the Batavian Government, was received, and on the evacuation of the Colony by Great Britain in February, 1803, the prisoners

were free to leave the Castle under the amnesty granted by the Batavian Commissioners.

During the short interregnum from 1803 to 1806, while the Cape was under the Batavian Government, Governor Janssen, and his colleague, Commissioner de Mist, gave their earnest attention to the condition of the frontier districts. They visited the Border, and personally interviewed the Hottentots and the Kafir chiefs, with the object of re-establishing a good understanding between them and the Colonists. In the course of their journey, they witnessed the deplorable results of the disturbances which had occurred—houses in ruins, fields desolated, and numerous families impoverished, wandering about homeless, and living scantily upon the small remnants of cattle they had been able to save from the hands of their invaders. A number of the farmers were induced to return to their old habitations and commence life anew. At Graaff-Reinet, a new Landdrost, Mr. Stockenstrom, was appointed, under whom tranquillity was restored; and the district was sub-divided, another Magistracy being formed at the Zwartkops River Valley, to which the name of "Uitenhage" was given. Between the Sundays and Fish Rivers, however, the country was still occupied by Kafirs under the chiefs T'Slambie, Congo and others, who were then in revolt against their paramount chief, Gaika. They acknowledged that the Great Fish River was the boundary of the Kafir territory, and promised to return there as soon as they had conquered or were reconciled to their chief, with whom they were at war. But these promises were never fulfilled. All the endeavours of the Dutch Border Commissioner, Capt. Alberti, to induce them to quit the Colony and retire to their own country, were in vain. The Government had no force to compel their retirement, and was therefore obliged to content itself with being on a half friendly footing with them. In this situation relations with the Kafirs remained, until the Colony was again taken under British dominion.

THE CAPE UNDER BRITISH DOMINION.

From the date of the surrender of the Cape to the British forces under General Sir David Baird, in 1806, the country may be said to have entered upon a new era. It then virtually became a British Colony. By the articles of capitulation, however, the burghers and inhabitants were guaranteed all the rights and privileges including their form of public worship, which they had hitherto enjoyed. The paper money actually in circulation was continued current as before, until the pleasure of His Britannic Majesty should be known. All *bona fide* private property remained free and untouched. Public lands and houses, the property of the Batavian Republic, were delivered up and remained as security for such of the paper money as was not already secured by mortgage upon the estates of individuals, without prejudice, however, to free use being made of the said lands and houses for public purposes.

The total population of the Colony at this period, was 73,663 souls, of whom 26,720 were of European descent; and the lands in occupation of individuals consisted of 96 places, measuring 26,136 morgen held in freehold; 355 morgen held in quitrent; and 1,739 places held on "loan-leases." The population was distributed as follows:—

	European Inhabitants.		Hottentots.		Slaves.	
	Men.	Women.	Men.	Women.	Men.	Women.
Cape Town	3,263	3,034	233	202	5,513	3,322
Cape District	802	630	343	244	3,154	1,139
Stellenbosch	2,613	2,286	1,221	1,239	5,728	2,986
Swellendam	2,551	2,235	2,108	2,174	1,795	1,064
Graaff-Reinet	2,394	2,103	2,239	2,491	899	483
Uitenhage.....	1,257	1,094	1,047	1,278	346	245
Tulbagh	1,289	1,169	1,416	1,422	1,621	991
Total	14,169	12,551	8,607	9,050	19,056	10,230

The general character of the policy adopted by Sir David Baird, and the several British Governors who succeeded him, partook in some measure of the liberal principles of administration introduced under the auspices of the Batavian Government. The Colonists were free to dispose of their produce upon the most advantageous terms, and a profitable market was at once provided by the large Naval and Military expenditure within the Colony itself, and at a later period by the establishment and supply of a garrison and squadron at St. Helena.

Earl Caledon, who was Governor from 1807 to 1811, established a system of postal communication between Cape Town and the country districts by relays of post-riders. He also instituted "Circuit Courts," appointing Commissioners from the Court of Justice to proceed once a year or oftener throughout the whole of the Colony and administer the laws among all classes of the inhabitants with the same power and authority as was exercised by the Court in Cape Town. He likewise sought to ameliorate the condition of the Hottentots by issuing regulations requiring that they should have a fixed place of abode, or otherwise be treated as vagabonds; and that all contracts entered into by them should be registered with the conditions as to wages, time of payment, and date of termination of contract, so that no master could act unfairly to them, or detain them, their wives, or children after the expiry of such term of contract. The object of these regulations was to protect the Hottentots, and encourage them to prefer entering the service of the inhabitants to leading an indolent life, by which they were rendered useless to themselves and the community at large.

The abolition of the slave trade and the discontinuance of the importation of slaves, at this time, were not without a beneficial influence on domestic life and the habits, manners and morals of the inhabitants. But considerable alarm was created in the western districts by an attempted insurrection of a number of the negroes in servitude. The plot originated with a slave named Louis, and two Irishmen, Hooper and Kelly. Their plan was to incite the slaves in the inland districts to rebel, and having armed them with such weapons as they could procure in the country, to march them to Cape Town, seize the batteries, and despatch a letter to the Governor demanding the liberty of the slaves of the Colony; and in case of this being refused, they were to make themselves masters of the magazines, force the prisons, release the prisoners, and fight for their liberty. Louis, Hopper and Kelly, dressed in grotesque uniform with gold and silver epaulettes, and the first wearing a large sword, drove to the farm of a Mr. P. G. Louw, of Zwartland, and passed themselves off as Spanish officers. The master being absent, the mistress did her best to provide a good supper and entertain them properly. Next morning they took possession of Louw's wagons and horses, and proceeded to the residence of his neighbour Basson, where they bound the proprietor and made themselves masters of the guns, powder, and ammunition, stating that their instructions were from the Government and the Fiscal, to take all Christians and carry them to Cape Town. Proceeding then from farm to farm, gathering wagons, horses and arms, and inciting the slaves at each place to join them, they formed a considerable cavalcade passing through Koeberg and

Tygerberg. Some of them plundered the farmers' houses, outraged the farmers' wives, and forced their European masters, tied and bound, into their wagons. News of the outbreak soon reached Cape Town, and a detachment of Infantry and Cavalry were marched out with such promptitude that the insurgents were surrounded and captured, some at Salt River and others at Koeberg. The number of prisoners taken was 326. Those of the slaves who were passive in the affair were returned to their masters, and the wagons, horses, saddles, guns and other property were given back to the owners. The remainder of the prisoners were sent to trial, and the leaders, Louis, Hooper, and Abraham Jepta, were sentenced to death, while Kelly was transported from the Colony.

A system of predatory warfare was reported to prevail on the eastern frontier, between the Colonists and the fugitive Kafirs; and complaints were also made of the incursions of Bushmen upon the farmers of the Nieuwveld and Zak River. Earl Caledon felt it desirable to obtain accurate information respecting these matters, and the way to remedy the evils complained of. He appointed an officer on whom he could rely, Colonel Collins of the 83rd Regiment, to visit these territories, and report the result of his observations. The reports furnished by Col. Collins contained very full and interesting information as to the character and history of the two races, the Bushman and Kafir. With regard to the Bushmen, he recommended the establishment of two or three Mission Institutions, around which they might be attracted and induced to settle down, and thus weaned from their predatory and wild life in the plain and mountains. As to the steps necessary to be taken for checking Kafir aggression and securing the permanent tranquillity of the Eastern Districts, his recommendation was to oblige all the Kafirs settled in the Zuurveld to withdraw to their own country across the Fish River, and to oppose innumerable obstacles to their return to the Colony.

It fell to the lot of Earl Caledon's successor, Sir John Francis Cradock (afterwards Lord Howden) to carry out this policy of expulsion. The landdrosts of Graaff-Reinet and Uitenhage, in 1811, reported that the country was overrun with Kafirs, and that their depredations were quite without precedent. Several colonists and their herdsmen were murdered, and in one instance the body of a young man, named Jacobus de Winter, was found by his father suspended to a tree by the lash of a wagon-whip, with both hands covering the face, giving reason to imagine that the assegais with which he had been pierced did not occasion instant death, and that he had endured most cruel and barbarous torture. An armed force, composed partly of troops and partly of burghers, from all the districts of the Colony, was called into the

field, and placed under the command of Lieut.-Colonel Graham of the Cape Regiment.

In the instructions to that Officer, Sir John Cradock stated that the basis of his action was to secure the undisturbed establishment of the territory surrendered by the Dutch. "It is unnecessary," he said, "to expatiate upon a subject of so plain a nature, where the arguments are so fully proved by the repeated aggression of the Kafir nation, who have made such continual inroads into our territories, and have to a great extent, after outrages of the most atrocious kind, banished the peaceable inhabitants from their dwellings and property. As the measures of passive conciliation and forbearance have proved ineffectual, it is necessary to adopt another mode of proceeding, and their complete expulsion from our Territory must be accomplished. I experience much satisfaction, while entering upon a measure of this description, from the general information that His Majesty's subjects have not in any of the late proceedings been the aggressors, but that the Kafir nation have been constantly the depredators and offenders. After this general view, it will be my desire that you take the most effectual measures to clear His Majesty's Territory from the Kafir nation or marauders of any description, and that they be repelled permanently within their own boundaries." The Amakosa Chief, Gaika, was informed of the intention of the Government, and expressed approval of the steps to be taken for driving the Kafirs into their own territory, as he said they had only occupied the Zuurveld in order to withdraw their allegiance from him, whose vassals they were.

The country in which the expeditionary force had to operate was one of the most difficult for military movements which could be conceived. From the Sunday's River to the Bushman's River, there is an extended jungle of high bush, affording cover, even at the present day, to the elephant and the buffalo; and behind this bush there rises a series of broken mountain ridges intersected with thickly wooded ravines, extending for a distance of forty to fifty miles in length and varying from nine to twelve miles in breadth. These ridges are known as the Zuurberg and Rietberg mountains, and the Bushman's River Pass; they are within view of the traveller by railway between Port Elizabeth and Alicedale Junction.

In November, 1811, Colonel Graham proceeded with his force, which he divided into three divisions—the right under his own command; the centre under Major Cuyler; and the left under Mr. Stockenstrom, landdrost of Graaff-Reinet. The armed burghers and the Cape Regiment, with some dragoons and artillery formed the advanced column; while the regular troops, including detachments of the Cape Regiment, the 83rd and the 60th Regiments,

formed the reserve, to guard against the Kafirs penetrating through any of the country to the rear of the commando, and entering the inhabited districts of the Colony.

Major Cuyler, with the centre division, went direct to Congo's Kraal; the chief was not visible, but all his troops were drawn up in battle array and ornamented with crane feathers, the emblem of war. By the messages sent, Congo appeared inclined to follow the advice given to him of quietly retiring to his own country, and was therefore allowed till next day to consider of it. Next day, however, the chief T'Slambie and many of his Kafirs were observed going towards an adjacent wood, and it was ascertained that the main body of his and Congo's followers were assembled around him. Col. Graham then united the right and centre forces, and dividing nearly one-half of them into companies of dismounted men, each sixty strong, ordered them to enter the wood and remain there while one of the enemy was to be found. This plan was repeated as other wooded fastnesses were reached, and ultimately proved effectual. The Kafirs had never been attacked on foot or in a wood before, and in the jungle their only arm, at that time the "assegai," was a miserable weapon, as room is required to throw it with effect. After several of their number had fallen, they fled from their favourite and hitherto undisturbed haunts—the chief T'Slambie foremost amongst them, with a whole herd of followers and cattle, retiring across the Great Fish River near to its mouth. Their abandoned kraals were burnt and their gardens and fields laid waste; but their women and children were invariably protected and restored to them, together with all captured cattle. The services of the burghers during the campaign were highly spoken of by Col. Graham; and he mentioned the following colonists as having specially distinguished themselves: Commandant Jacobus Linde, of Swellendam; Botha, of George; Gabriel Stoltz, Ignatius Muller, William Nel, and John and Isaac van Niekerk of Uitenhage, and Piet Pretorius of Graaff-Reinet.

During the early part of these operations, which extended over twelve days, Col. Graham sent orders to Mr. Stockenstrom, who was on the north side of the Zuurberg, to join the right division on the south side; and the latter at once left his quarters, accompanied by twenty-four men, chiefly burgher commandants. When more than half-way across, on the top of the Zuurberg mountain, at a spot known as Doorn Nek, where there was open smooth ground, a number of Kafirs met the party, and Mr. Stockenstrom, placing a fatal confidence in their friendly professions, dismounted and entered into conversation with them. For nearly half an hour the venerable magistrate smoked his pipe with them, and passed the tobacco-bag round amongst them, while the subject of the expulsion was discussed. He did all he could to persuade them

to leave, and assured them that not a shot should be fired if they went across the Fish River quietly. While the "palaver" was proceeding, some other Kafirs arrived, who reported that blood had been shed. The character of the meeting at once changed. The Kafirs, now upwards of one hundred in number, rushed upon Mr. Stockenstrom and those who were next to him, as they were mounting their horses, and instantly murdered the old gentleman, eight of the farmers who were with him, and a Hottentot. The rest of the party managed to effect their escape and brought the sad tidings to Col. Graham.

For some time after the expulsion of the Kafirs, the military and burghers continued to guard the boundary along the Great Fish River. Col. Graham urged that the vacated tract should at once be occupied, and the former residents of the districts invited to return to them; but the Governor resisted this, as he sought to maintain the country as "neutral ground," and only sanctioned a small number of farmers being encouraged to settle there for the convenience of the supply of the troops at the military head-quarters, which received the name of Graham's Town.

Sir John Cradock was disposed to think that, to prevent the evils which had to be overcome on the frontier, it was desirable to concentrate the population of the country and secure their attention to agriculture more than to pastoral pursuits, which tended to a roving life, and was the cause of their weakness and occasional troubles. The system of "loan-leases" appeared to him from this point of view to be very injurious, and he was determined not to perpetuate it. The question of land tenure had been under consideration of the Government for some time, and by Imperial as well as Colonial authorities it was considered desirable that the holders of land should no longer be subject to a revocable lease, but have such a tenure as would enable them to apply capital to the improvement of their estates. In 1812, a proclamation was issued by Sir J. Cradock, allowing the holders of all *lands on loan* to convert them into perpetual quitrent properties and to hold the same hereditarily for the annual payment of a sum to be prescribed according to the situation, fertility, and other circumstances of the ground. The object of this was, as the proclamation states, "a paternal desire to give to the farmers the security of title to their land, without any claim to resumption on the part of Government, so that they might be encouraged to plant timber, and improve and extend agriculture, by having the right to dispose of their places as they chose, by dividing the same among their children, letting, selling, or otherwise alienating it." In the following year, Cradock resigned the Government, much to the regret of all classes of colonists, who in public addresses testified that his three years' administration of

the Cape had conduced greatly to the happiness and prosperity of the inhabitants.

He was succeeded by Lord Charles Somerset, who arrived on the 5th April, 1814. He found the troublous affairs of the border varied by a rebellion among some of the colonists of European descent, of which he gave a detailed account to Earl Bathurst.

The circumstances which led to this outbreak arose out of the relations between master and servant. A Hottentot who had been several years in the service of Frederick Bezuidenhout, residing near the border, in what is now known as Glen Lynden (then termed the Baviaan's River), complained of ill-treatment. His complaint was made to Mr. (afterwards Sir Andries) Stockenstrom, who, in succession to his father, filled the office of Landdrost at Graaff-Reinet. The Field-cornet of Baviaan's River, a colonist named Opperman, was directed to inquire into the case, and to see that justice was done to the complainant. Bezuidenhout considered this interference between him and his servant to be an innovation of his right—an intolerable exhibition of authority; and set both the Field-cornet and the Magistrate at defiance. In consequence of this, application was made to the Commission of Circuit, and a warrant issued for his apprehension.

The Under-Sheriff was then dispatched by Mr. Stockenstrom to take Bezuidenhout into custody, and as it was reported he had sworn never to surrender himself, the officer of justice was accompanied by a military escort, under Lieut. Rosseau, a native of the Colony, with twenty men of the Cape Corps. When they approached Bezuidenhout's dwelling, he called to them not to advance farther, and he himself retreated, accompanied by two others, behind a parapet wall, from whence, after calling to the party to leave his premises, he commenced firing upon them. He fired twelve or fourteen rounds before the party noticed it, after which they returned his fire, and he with the two men with him retired to a cave in a rock, which it subsequently appeared he originally intended to do, as he had lodged there a considerable quantity of ammunition. The mouth of this cave could only be approached by one man at a time, but from the top its occupants could be heard and spoken to. From thence Bezuidenhout was repeatedly summoned to surrender, which he with vehement imprecations refused to do, saying also that they should never arrest him while alive, and that he would shoot many of them before he himself should fall. The sergeant of the party, however, approached near to the mouth of the cave, and while Bezuidenhout was in the act of levelling at him, shot him dead. His companions surrendered and were carried prisoners to Graaff-Reinet.

The occurrence created considerable sensation. At the burial of

the deceased, his brother, in a state of great excitement, called upon all around him to avenge his death; and from that day he and his family connections seem to have set themselves to mature and carry out plans of retaliation upon the civil and military authorities. They sought to call in the aid of the Kafirs to extirpate the "tyrants," promising them the Zuurveld and the cattle of those colonists who would not join them against the Government. Captain Andrews, the officer in command of the nearest military post, obtained information of the movement, and at once arrested one of the most influential of those concerned in it, named Hendrik Prinsloo. This led to the immediate assemblage of an insurgent band, demanding Prinsloo's release. Many were intimidated into joining them by a story being circulated that those who did not assist would be given over to the plunder of the Kafirs. But the chief Gaika, who had been appealed to, could not be induced to move; he gave them clearly to understand that he would not embroil himself in their quarrels. Meanwhile, martial law was proclaimed, and the military were strengthened by the arrival of reinforcements and of many loyal burghers under their field-commandants. In face of the force thus arrayed against them, the rebel leaders fled away, while numbers of their followers came forward and laid down their arms. Bezuidenhout, with some of his family and his brother-in-law Faber, endeavoured to escape into Kafirland, but their intention becoming known a detachment of the Cape regiment under Captain Fraser proceeded to overtake them. They came up to them and demanded their surrender. Bezuidenhout's reply was to raise his gun and fire upon the soldiers. His wife assisted him in re-loading his gun and even fired a shot herself, exclaiming "Let us never be taken alive! let us die here together." After this Bezuidenhout fell mortally wounded, and thereupon the others surrendered themselves.

The sequel of the affair was that thirty-nine out of the whole of the insurgents were taken as prisoners to Uitenhage on the charge of high treason and waging war against the Crown. A special commission of the Court of Justice was sent to hear the case, and after a lengthened trial in the Drostdy of Uitenhage, five of the prisoners were sentenced to be executed, viz., H. F. Prinsloo, S. C. Bothma, C. J. Faber, T. C. de Klerck, and A. C. Bothma. Others were transported and banished from the border, and the remainder were ordered to witness the execution of their comrades, and then to be released. The *fiat executio* put in force on this occasion was the first instance of colonists of European stock suffering death for treason against the Crown. Many of the friends of the delinquents hoped to the last that the utmost severity of the law would not be enforced, and the abhorrent circumstances attending it created an excitement and ill-feeling which were not allayed

for many years after. The spot selected as the place of execution was the hill known as Slaghters Nek, overlooking the valley of the Great Fish River, where the chief act of rebellion had been committed. There the machinery of death was erected. The hangman was a negro. The halters were insufficient to bear the weight of the unfortunate men, or as some suspected were intentionally cut; and no sooner had the platform been removed than four of the five fell from the gallows. The unfortunate men cried for mercy, and one addressing himself to the bystanders, exclaimed that by this accident it was clearly manifest God would not permit them to be put to death. The officer in charge, Colonel Cuyler, in the stern performance of his duty, had the execution carried out according to the letter of the sentence.

The Governor, in his despatch, added that it did not appear from the examinations and confessions of the prisoners that they had any ground of complaint beyond that already mentioned; but accustomed to consider the Hottentot as an inferior being, they were extremely impatient of the restraint the British regulations put upon them, and it was particularly obnoxious to have the Cape regiment, chiefly composed of Hottentots, among them to enforce these regulations. His Excellency added: "This feeling is very general, and although the Cape Corps has done its duty on this and on every occasion and merits my warmest acknowledgments, yet, had I a British battalion with which I could replace it, I would withdraw it from the frontier on account of the prejudices of the people."

The troops at his disposal, however, were by no means sufficient to maintain the security of the border, and complaints of Kafir depredations became as rife as ever. Lord Somerset then conceived the policy of recognising the ascendancy of the chief Gaika over all the Kafir tribes inhabiting the border, and of maintaining pacific relations with them by means of his controlling authority. He repaired to the frontier in 1817, and held an interview with this chieftain, at which T'Slambie and others were present. After some discussion, arrangements were made with them on the basis of the recognition of the supremacy of Gaika over the other tribes west of the Kei River, and it was stipulated that all intercourse with the Colony should be prohibited except through the medium of that chief. It was also agreed on the part of the chiefs to accept the principle of Kafir law known as "collective responsibility," by which the head of a kraal is responsible for the families under him, the headman of a number of kraals for the kraals or villages under him, and so the area of responsibility gradually extending until the supreme authority, the chief, is reached, to which all are answerable. His Excellency told them that he intended in future to send to the kraals to which stolen

cattle should be traced, and to call upon such kraal to restore it, and if the people of that kraal should have permitted the stolen cattle to pass through and not have stopped it, that he should then require of the kraal an equal number of Kafir cattle in lieu of that which had been stolen.

The agreement thus entered into was adhered to with tolerable good faith for a while; but tribal feuds between Gaika and his uncle T'Slambie, and jealousy of the alliance of the former with the Colony, led to a combination against Gaika by the other chiefs. In November, 1818, he was attacked and defeated by them at Amalinda, near Debe Nek, in the King William's Town district, and compelled to take flight to the Kahaberg, near the sources of the Koonap River.

Gaika appealed for aid to the Colonial Government, and it was felt that it was essential his cause should be espoused. The system of Kafir plundering was daily increasing, and with it the usual number of murders, some of which were traced to T'Slambie's people. The officer commanding on the frontier, Lieut.-Col. Brereton, was authorised to call T'Slambie to account, and in 1819 he entered Kaffraria with a large force of military and mounted burghers. T'Slambie and the minor hostile chiefs, however, evaded him, and retired to the impenetrable fastnesses of the bush. Brereton's force carried off vast herds of cattle from the people's kraals, and returned to Graham's Town, without having effected anything against the chiefs. He restored Gaika to his former residence, and presented him with a large quantity of cattle beyond what he had been plundered of, and also gave to the colonists a number of Kafir cattle equal to what they had been dispossessed of. He then disbanded the burgher commando, which had accompanied him.

This gave T'Slambie's followers an opportunity of entering the Colony at a time when the Government had but a small force to repel them. The wholesale capture of their cattle had roused them to a frenzy of revenge against the military and the colonists, and their excited feelings were still more inflamed by the native eloquence of a seer or prophet, named Makanna or Lynx, who claimed to have been sent by the Great Spirit to assist them in battle against the white man. He counselled them to unite their forces for a simultaneous attack upon Graham's Town, the head-quarters of the British troops and the depôt of stores and ammunition. On the 22nd April, 1819, they mustered their army, 10,000 in number, and suddenly made their appearance on the hills above the military cantonment. Lord Somerset, in reporting the event, said:—

"The close bushy country which intervenes between Graham's Town and the Kafir Border, had enabled this body to approach very

near the place before they were discovered, and when they were partially so, Lieut.-Colonel Willshire was absent inspecting a part of the Colonial Troop of Cavalry, at some distance from the town. The small garrison, not exceeding altogether 320 men, was ably drawn out and formed by Capt. Trappes, of the 72nd Regiment, for the defence of the place, and 60 men of the R. A. Corps, under Lieut. Cartwright, were detached for the protection of the Barracks, which are situated about 2,000 paces from the town, which itself is straggling and open. As soon as Lieut.-Colonel Willshire was apprised of what was going on, he put himself at the head of his troop and rode towards the enemy to reconnoitre, and found him advancing with a rapidity which had nearly prevented the Lieut.-Colonel's retreat upon the town. However he joined his small force, and made the necessary dispositions for receiving the attack. The Kafirs halted on an eminence to make their last arrangement, and divided their force into three columns, commanded, it is supposed, by the three chiefs who are known to be principally hostile to the Colony, viz.,—T'Slambie, Congo, and Lynx. Two of the columns were directed upon the town, the third advanced against the Barracks, while about 1,000 men were posted between Graham's Town and the nearest station from whence relief could come to our troops (Blue Krans). They advanced by signal (at a discharge of musketry from an adjoining hill) and rushed forward with great impetuosity, making the air resound with their appalling shrieks. Lieut.-Colonel Willshire received them with firmness, and when but within a few paces opened his fire of artillery and musketry upon them with such effect, as very soon to check their progress and evidently to make them waver. Our little band cheered in its turn; and advanced towards the enemy, who very soon retreated, dragging away numbers of his wounded. The attack at the Barracks lasted longer, the enemy having penetrated even into the Barrack Square, but Lieut. Cartwright defended his post with great intrepidity, and drove back the enemy, after having killed nearly treble his own numbers, of whom 102 were afterwards counted in the Barrack Square alone. The whole loss of the Kafirs on this occasion, in killed, cannot be estimated at less than between 700 and 800, whilst our loss only consisted in three killed and five wounded. We learn that T'Slambie lost three sons in this affair, and that the Kafirs retreated into their own country with a great number of wounded."

Not only Graham's Town, but other parts of the district of Uitenhage, suffered from the Kafir inroad at this time. The invading tribes proceeded as far as the Sunday's River, destroying farms, killing thirty inhabitants, including nine unoffending members of the Moravian Mission Institution, and carrying off troops of cattle, horses, and sheep.

The burgher forces of the Colony from west and east were again summoned to assemble, and between the 22nd and 31st of July, two thousand of them marched into Kafirland, supported by detachments of the regulars and artillery. After protracted and fatiguing movements, to clear the enemy out of the bushy

fastnesses of the Chumie and Keiskamma valleys, some of the hostile chiefs treated for mercy and peace. Makanna or Lynx voluntarily surrendered himself to Commandant Stockenstrom as a prisoner. Walking into camp, with the magnanimity of a Roman, he said, "If I have occasioned the war, let me see if delivering myself up to the conquerors will restore peace to my country!" and he begged that the war should not be continued, as all their cattle had been taken by Colonel Brereton, and the people were starving. Congo, Habanna, and others of minor note surrendered to Colonel Willshire. T'Slambie took refuge for a time beyond the Tembu territory. Gaika was permanently restored to the lands whence he had been driven, and the inferior chiefs, who had surrendered, declared themselves subordinate to him.

During all this period a considerable portion of the scant population of the Colony was withdrawn from their ordinary avocations, performing the duties of armed burghers, at great personal expense and sacrifice. The Commando called out in 1811 had not been disbanded until 1815. Three years afterwards they were summoned for two months to accompany Col. Brereton in his raid upon T'Slambie. In 1819 they were in the field for seven months, mounted and equipped at their own cost and submitting to fatigue and privation without a murmur. Lord Somerset did not fail to represent the merits and value of the force. "The burghers and their respective Commandants," he said, "have fulfilled their duties with unexampled perseverance; but no praise which I could bestow would describe the merits of Mr. Landdrost Stockenstrom, who on every occasion has led his men with the greatest dexterity, courage and foresight, and to whose knowledge of the country the Officer Commanding has been greatly indebted."

At the termination of hostilities in October, 1819, the Governor, at a conference with Gaika and other Chiefs, took steps for securing to the Colony some permanent advantages as a result of the recent operations. The occupation of the thickets along the Fish River had exposed the Colony to invasion, and it was stipulated at this conference that the bush country was to be cleared of all Kafirs, the Chief Congo and his adherents who inhabited these fastnesses being compelled to retire behind the Keiskamma. It was further stipulated that the Kafir border should in future be the ridge of the Kat River Hills from the Winterberg to where that ridge joins the River Chumie, the Chumie itself to its junction with the Keiskamma, and thence the Keiskamma to its embouchure. The Colonial boundary was thus extended eastward to the Keiskamma River, and two military posts were to be established in the most commanding situations of the ceded territory. At the same time, missionary agents (the Rev. J.

Brownlee and the Rev. W. R. Thomson) were appointed to reside near Gaika, in Kafirland, with instructions to cultivate friendly intercourse with the tribe, and by the influence of example to attempt to diffuse amongst them the principles of the Christian religion and the arts of civilized life.

"The country thus ceded," wrote Lord Somerset, on the 15th October, 1819, from his camp on the Gwanga, to the Secretary of State, "is as fine a portion of ground as is to be found in any part of the world; and, together with the unappropriated lands in the Zuurveld might perhaps be worthy of your Lordship's consideration with the view of systematic colonization."

During his previous visit to the frontier, in 1817, His Excellency had been so favourably impressed with the appearance of the unoccupied country between the Sunday and Fish Rivers that he expressed a wish that it could be settled by many of those who, in England, were anxious to find employment and food in new countries, and to whom it was understood the Home Government was willing to afford facilities for emigration. He then wrote:—

"Here is, indeed, a very fine country upon which to employ and maintain a multitude of settlers. This tract, particularly healthy for every description of cattle and sheep, well wooded and having very fine springs in it, is nearly uninhabited. The paucity of borderers has been such that they have never been able to settle in quiet. The Kafirs whose territory is on the east side of the Great Fish River, and whose propensity to thieving is similar to that of most other savages, have continually viewed the occupation of this fine country by the colonists with jealousy, and have molested them so systematically by constant depredations upon their lands that insulated settlers have imbibed a great dread of occupying land in the vicinity of these artful marauders.

It was found necessary in 1812 to drive them back by military measures, as your lordship is aware, and since that period to keep a military force on the Frontier to check further inroad and to give time for settlers to establish themselves in such strength and numbers as shall supersede the necessity of keeping a military force for their protection.

"This, then, is the situation of that part of this country which I would wish to draw your lordship's attention to the settlement thereof, as a measure of Government; fairly stating to your lordship the disadvantages to which settlers would be at first exposed, and not disguising from you that I am much swayed in recommending the plan by a strong wish to be able eventually to withdraw the military detachments from that quarter, for many reasons which are not at this moment the subject of discussion.

"It is just that settlers should be aware that their property will be, in some measure, exposed, in the first instance, to be plundered by their restless neighbours, unless their own vigilance and courage shall considerably aid in protecting it; but it is, at the same time,

proper to tell them that vigilance and courage will have the effect of giving their property efficient protection; that the Kafirs do not molest those hamlets where six or seven families unite together for mutual support, and are constantly on the alert for their defence in case of attack. We have several instances of associations of this nature living in perfect security quite on the border of the Fish River, not one hundred yards from the Kafir country. The Kafirs are constantly on the watch, and commit their thefts when they discover our settlers to be off their guard. The herds of these families are tended in common by armed watchmen; should these be indolent or negligent they are the victims of their supineness by the loss of their property, and sometimes the sleeping herdsmen lose their lives. It is obvious that increase of population will remedy this evil, and that the Kafirs cannot, from their not using firearms, be any match for Europeans who have such to oppose to them.

"Having thus stated the disadvantages to which settlers would be liable in the country we have to offer them, it is now necessary to advert to the more favourable side of the picture, and to say that their reward is to be found in the cultivation of a most fertile soil in the most healthy and temperate climate in the universe, where cold is never so piercing as to congeal water, and where the rays of the sun are never so powerful as to render exposure to them injurious, or to impede the usual labours of the field. . . Upon a most fruitful soil, the same species of cultivation which affords food to man in our country is most likely to be successful here; added to which, that when the immediate wants of the new settlers are supplied, no country yields finer wool than may be here reared; that the corn of this country has brought in the London market the highest price known there; that tobacco is an article which might be advantageously cultivated and prepared so as to equal the best American produce; and that experiments upon the cotton plant have proved that it may be cultivated here to the greatest advantage."

Lord Somerset was clear and candid in his statement of the drawbacks as well as of the attractions which the Cape frontier districts then offered to those who were looking for "a new land of promise." The events happening along the border from 1817 to 1819, must also have kept the Secretary of State well informed of what the new settlers might have to contend with. But no reference to these drawbacks was made when the Chancellor of the Exchequer, in 1819, asked the House of Commons for a vote of £50,000 for the encouragement of emigration to the Cape. The country was glowingly represented as unrivalled in the world for its climate, natural beauty, and fertility; and when the vote was granted, the eagerness and anxiety of individuals to be allowed to emigrate to South Africa were unbounded, there being no fewer than 90,000 applicants while the number accepted amounted altogether to about 5,000.

The scheme of emigration was carried out on the lines originally

suggested by Lord Somerset. The emigrants were required to be of good character and possessed of some means. No one was accepted who had not sufficient to carry out, at the least, ten able-bodied individuals above eighteen years of age, with or without families. And to give security to the Government that they had such means, the leaders of parties had to deposit at the rate of £10 for every family, provided that the family did not consist of more than one man, one woman, and two children under fourteen years of age.

Passages were to be provided for them at the expense of Government, and they were to receive a free grant of land at the rate of 100 acres for every person or family taken out. Of the deposit of £10 made to the Government, one-third was to be repaid on landing, when the victualling at the expense of Government ceased; a further proportion of one-third was to be repaid as soon as it was certified that the settlers under the direction of the person taking them out were actually located upon the land assigned to them; and the remainder at the expiration of three months from the date of their location. A supply of agricultural implements was to be sent out, with a view to disposing of them to such settlers as might require them at prime cost or on credit, and seed corn was to be supplied if necessary on terms equally favourable. Bibles and Common Prayer Books were also distributed to those who might apply to receive them. In cases where one hundred families went together and asked to carry out with them a minister of their own persuasion, Government was to assign a salary to such a minister, if he should be approved of by the Secretary of State.

Subsequently, it was, by the King's pleasure, made a special condition of the several grants in the new settlement, that the lands should be cultivated by means of free labour alone, and that any employment of slaves upon them would render the lands subject to forfeiture. And, later on, the King's commands were given to make provision, by proclamation, that English settlers coming to reside in the Colony should, as long as they remained in the state in which they arrived, enjoy the same rights and powers of devising property which they had under the law of England; and that, in case of entering into the marriage state within the Colony, they might, by an ante-nuptial contract, exclude community of property according to the Colonial law, and retain to themselves the right of free testamentary disposition as in England—such contracts, however, not affecting or destroying the rights of children, acquired at their birth, under the common law of the Colony.*

* By Act No. 23 of 1874, all restrictions on the freedom of the disposition of property has been removed; but without interference with the Roman Dutch law of community of property, or the laws of inheritance *ab intestato*.

In the month of November, 1819, Lord Somerset received intimation that the transport ships, with the emigrants, would leave England that month, so as to arrive at the Cape at the commencement of the planting season, and he was directed to make the necessary arrangements for their reception in the Colony. He was given a discretionary authority to afford them assistance in every practicable manner so as to enable them to carry their ultimate objects into effect. "But," wrote Earl Bathurst, "experience has shown that the settlement and cultivation of waste land is best achieved by the active application of the means which the settlers on it may themselves possess; and your lordship will not give this further assistance, except in cases where it may be essentially necessary to prevent the industrious settler from being overwhelmed by the pressure of unavoidable difficulties. . . . And generally it is my duty to convey to you the anxious wish and injunctions of the Prince Regent that in confiding these settlers to your lordship's care, they will not find that they have lost the protection of His Majesty's Paternal Government."

This despatch reached Lord Somerset when he was on the eve of leaving the Cape for England, in consequence of the state of health of one of the members of his family; and the duty of receiving and locating the emigrants devolved upon the Acting Governor, Sir Rufane Shaw Donkin, who was ably assisted by Colonel Bird, the Colonial Secretary, and Mr. Henry Ellis, the deputy Secretary.

The first transport ships, the *Nautilis*, *Ocean* and *Chapman*, arrived in Algoa Bay in April, 1820, and during the succeeding months, they were followed by twenty-three other vessels conveying the remainder of the emigrant band. The landing place was then unnamed; it consisted of a wave-washed beach, lined by ridges of barren sand-hills, with a small fortification crowning the heights, and a few cottages and huts. The Acting Governor anticipated from the introduction of British industry and enterprise the formation of an important commercial town at this place. He named it "Port Elizabeth" after his deceased lady, to whose memory he erected an obelisk on the hill, still known as Donkin's Reserve.

Among the emigrants was Thomas Pringle, the Scottish lyric poet, who in his "Narrative of a Residence in South Africa," has given us a graphic word-picture of the landing of the settlers:—"It was," he says, "an animated and interesting scene. Around us in the west corner of the spacious bay were anchored ten or twelve large vessels, which had recently arrived with emigrants, of whom a great proportion was still on board. Directly in front, on a rising ground a few hundred yards from the beach, stood the little fortified barrack or block-house, called Fort Frederick, occupied by a

division of the 72nd regiment, with the tents and pavilions of the officers pitched on the heights around it. At the foot of those heights, nearer the beach, stood three thatched cottages, and one or two wooden houses brought out from England, which now formed the offices of the commissaries and other civil functionaries appointed to transact the business of the emigration, and to provide the settlers with provisions and other stores, and with carriages for their conveyance up the country. Interspersed among these offices, and among the pavilions of the Government functionaries and naval officers employed on shore, were scattered large depôts of agricultural implements, carpenters' and blacksmiths' tools, and ironware of all descriptions, sent out by the home government to be furnished to the settlers at prime cost. About two furlongs to the eastward, on a level spot between the sand-hills on the beach and the stony heights beyond, lay the camp of the emigrants. Nearly a thousand souls on an average were at present lodged there in military tents; but parties were daily moving off in long trains of bullock waggons, to proceed to their appointed places of location in the interior, while their place was immediately occupied by fresh bands, hourly disembarking from the vessels in the bay. A suitable background to this animated picture, as viewed by us from the anchorage, was supplied by the heights over the Zwartkops River, covered with a dense jungle, and by the picturesque peaks of the Winterhoek and the dark masses of the Zuurberg ridge far to the northward, distinctly outlined in the clear blue sky. The whole scene was such as could not fail to impress deeply the most unconcerned spectator. To us—who had embarked all our worldly property and earthly prospects, our own future fortunes and the fate of our posterity, in this enterprise—it was interesting and exciting to an intense degree."

The accompanying illustration is from a painting by the late Mr. T. Baines, now in the possession of Reuben Ayliff, Esq., of Graham's Town, a descendant of one of the orginal settlers.

A few detached parties of the emigrants were distributed in the Western districts of the Colony; the Scotch settlers under Mr. Pringle were located on the Baviaan's River, in the Somerset district; but the main body, numbering about 3,800 souls, were placed in the country between the Fish and Bushman's Rivers, which received the name of Albany. Among the "heads of parties" were gentlemen of high acquirements and good family connexions, retired military and naval officers, and other persons of the greatest respectability, while the parties themselves comprised all kinds of handicraftsmen and husbandmen.

Arrived in Albany, in a favourable season, all seemed fair and beautiful. Fine grassy hills and dales, variegated with bush and

forest, everywhere exhibited to the eye the most enchanting views. When all were located in their several parties, the country presented a singular aspect. "At this period," says the Rev. W. Shaw, who accompanied them from England, "in the discharge of my duties as a minister, I often made the tour of the entire settlement. It was curious to see so many small encampments scattered through every part of the country, the tents contrasting strikingly with the foliage of the copse and brushwood, near which, for convenience of shade and shelter, many of them were pitched. It was interesting in many places to see *the first tree* felled—the commencement of the *first wattle-and-daub house*—and the *first furrow* made by the plough in the virgin soil. And I must bear my humble testimony, that if any people ever began in good earnest the necessary operations for causing mother earth to yield the needful supplies, with which she is wont to bless the industrious, the British Settlers in Albany, with but few exceptions, did so. They seemed resolved that, though they could not ensure success, they would at least strive to deserve it."

Wheat was extensively sown in all parts of the settlement, and nothing could be more promising than the crops in the early stage of their growth; but just as the grains formed in the ear, the blight known as "rust" attacked them and the whole became worthless. The wheat crops proved a total failure, not only for the first year, but for two or three succeeding seasons. This calamity was followed by long-continued and heavy floods, which caused serious damage to houses and gardens and stock, and subjected most of the emigrants to great suffering and privation. Their fellow-colonists and their countrymen in England and in India, on learning of their disasters, generously contributed to their relief. But the liberality of the Government, who through the Commissariat of the frontier army, continued to supply them with rations, removed anything like absolute want; and the settlers themselves shewed a brave determination to endure and make the best of their hardships—notwithstanding their first disappointments, believing firmly in the natural resources of the country. Indian corn or maize and pumpkins and potatoes supplied the place of wheat; roasted barley, ground into a fine powder, formed a substitute for coffee, and wild honey from the rocks or woods furnished the means of sweetening it; the leaves of wild shrubs and plants were used as a refreshing beverage, instead of tea; well-dressed sheepskins were converted into jackets and trowsers and skirts; and the leaves of the *palmiet*, growing in some of the streams, formed material for the broad-brimmed hats of the men and children, and even provided trim bonnets for the fair sex.

As they became accustomed to the novelty of their situation, several of them realised that it was impossible for families to live

on the one hundred acre grants of land which had been allotted them, and they petitioned the Government for an augmentation of their lands, which in some instances was acceded to, while in other cases adjacent grants were obtained by purchase, enabling many of the settlers to pursue the mode of farming—pastoral as well as agricultural—usual in the Colony.

Meanwhile, there was a movement of several of the more energetic and restless spirits to seek other occupations and create new industries. Some of the handicraftsmen found employment in Graham's Town and other places where skilled labour was in demand. Others made hunting expeditions into the country eastward along the coast, which was full of game of all kinds, including troops of elephants; and not a few began a contraband trade in cattle and ivory with the Kafirs. This led to the establishment in 1821, of a fair at Fort Wilshire, on the banks of the Keiskamma, where open and legitimate barter was carried on. Elephants' tusks, corn, gum, mats, baskets, skins of wild animals, &c., were the articles of produce brought in for sale by the Kafirs; while the stock in trade of the English traders consisted of beads and buttons (then the native circulating medium), and blankets, pots, brass and tinware—the value of which had begun to be appreciated by the Kafirs. This was the beginning of a commerce which soon increased to an extent far beyond what could have been then anticipated. Many of the settlers commenced trafficking with small investments, of the value of merely a few pounds sterling, and found their way to the fair on foot or on horseback, or in rude sleighs drawn by oxen; but, pushing trade with energy and skill, not only among the natives, but also among their Dutch fellow-colonists, they ultimately laid the foundations of large and successful mercantile establishments and accumulated very handsome fortunes.

Before the close of 1821, Lord Charles Somerset returned to the Colony. He took umbrage at the action of his *locum tenens*, Sir Rufane Donkin, who had reprimanded his son, Capt. Somerset, for some infraction of military discipline; and, violating ordinary official courtesy, refused to meet him on arrival at Government House. This feeling of hostility seems to have been extended to the details of the policy which Sir Rufane Donkin had adopted during his administration as Acting Governor. A settlement named Fredericksburg, on the river Beka, in the ceded territory, formed of the half-pay officers and discharged soldiers of the African Corps, was ordered to be abandoned; the fair at Fort Wilshire was abolished, and traffic with the natives forbidden; a line of posts along the Fish River, which had previously effectually protected the settlers, was withdrawn; the seat of magistracy was removed from Bathurst to Graham's

Town, and the magistrate appointed by Sir Rufane Donkin superseded.

These acts created a general distrust in the stability of the measures of the Government; and a number of the principal settlers made arrangements for holding a meeting at Graham's Town to express their opinion, in true British manner, on the state of public affairs. Lord Somerset being informed of their intention, immediately issued a high-handed proclamation, notifying that public meetings for the discussion of public matters and political subjects were contrary to the ancient laws and usages of the Colony, and anyone attempting any assemblage of such nature without his sanction, or that of the local magistrate in distant districts, was guilty of a high misdemeanour, severely punishable.

Finding this obstacle in their path, they resolved upon making their position known to His Majesty's Government; and in 1823, they addressed a memorial to the Secretary of State. They prefaced their complaints by stating, "That whatever may have been the individual disappointments and failures incidental to so numerous an emigration, they do not present themselves to His Majesty's Government with any complaint of the natural disadvantages of the country to which they have been sent; and they have ever been actuated by one undivided feeling of respect and gratitude for the liberal assistance of the British Government, a feeling which future reverses can never efface." They then set forth their grievances, the most pressing and insupportable being the insecurity of the border, and the depredations of the Kafirs, which they asserted were in a great measure produced by the vacillating policy pursued by the Colonial Government in the management of their affairs. They concluded, however, by cherishing the hope that their interests would receive due regard and attention, and "that at no distant period a numerous and flourishing colony might be here governed upon British principles and by British laws."

Not only at Graham's Town, but also in Cape Town, the introduction of the British settlers had excited amongst the population a greater spirit of vigilance and attention to the acts of the Government than had existed before, rendering any exercise of official authority objectionable that was not founded upon the law.

Mr. Thomas Pringle, the poet, after having resided for two years at Glen Lynden and having seen his Scotch party fairly settled and established there, proceeded to Cape Town, where he was joined by a former College-companion, Mr. John Fairbairn. They opened an Academy for the instruction of young men, and commenced the publication of a literary periodical for the diffusion of useful

information. At the same time a printing-press was established by Mr. George Greig, who, in January, 1824, issued a newspaper, the *South African Commercial Advertiser*, and shortly afterwards solicited and obtained the aid of Fairbairn and Pringle in its editorial management.

The new broad sheet was received with delight by the public, as a medium of communicating general information—the only publication previously existing being the dry-as-dust official *Cape Gazette*. It was continued for sixteen successive numbers without eliciting any interference from the authorities. But a trial for libel was proceeding in the Court of Justice, in the course of which the defendant, named Edwards, indulged in aspersions on the character of the Governor. Lord Somerset was apprehensive that the proceedings would be published, and under his instructions, the Fiscal (or Crown Prosecutor) made a demand upon Mr. Greig for the proof sheets of the paper which was to appear next day. These were supplied, and the Fiscal returned them with a qualified *imprimatur*—not approving of the whole contents but allowing the paper to be published. He required of the publisher, however, to give substantial security that nothing offensive should appear in any future number. Mr. Greig, with his friends, Fairbairn and Pringle, at once determined upon the course to be pursued; and next morning publicly announced that they disdained, as British subjects, to submit to the degradation of a censorship of the press, and therefore discontinued the publication of the paper, pending an appeal to the British Government. This action greatly incensed the Governor, who issued a warrant directing the Fiscal to seal up the printing presses, and notify to Greig that as "his conduct had proved subversive of due submission to the lawful commands of the constituted authorities," he was to quit the Colony in one month, in default of which he was to be arrested and sent out of it.

The literary periodical—the *South African Journal*—which had only reached two numbers, was next looked after by the Fiscal, and a warning conveyed to Pringle that criticism of the Colonial Administration might involve a public prosecution. Pringle and Fairbairn at once notified their intention of discontinuing its publication under such circumstances.

Meanwhile, Mr. Greig proceeded to England, and, backed upon a strong memorial from the colonists, was successful in his appeal to the home authorities. By order of Earl Bathurst, his press was relieved from the odious incubus of the censorship, and a written authority was given that his license to publish should be liable to be cancelled by the Governor in Council only, and not by the Governor alone. Under this guarantee the publication of the newspaper was resumed, Mr. Fairbairn being its sole editor; but, unfor-

tunately, a year or two afterwards, it again fell under the ban of the Government. The occasion for this act was not the publication of any obnoxious original article, but of an extract copied from the London *Times*, which Lord Charles Somerset represented as of a calumnious nature. The Cape community felt the suppresion of their favourite paper to be a loss to the colonists generally; and as they were denied the liberty of holding a public meeting in the Colony to take the circumstances into consideration, they resolved upon an appeal to the British Ministry, and failing that, to the British public. Mr. Fairbairn was delegated to undertake this mission, and on his arrival in England he was supported by all the influence of the merchants and others connected with the Colony residing in London. A change of ministry had also taken place, and Mr. Huskisson, who was then at the Colonial Office, frankly conceded to the expressed wishes of the colonists, and on behalf of the Government intimated his determination that "the Press should be placed under the control and the protection of *the law*, and no arbitrary suppressions should take place in future." Upon this independent footing, secured for it by the exertions of Mr. Fairbairn, the South African Press has been conducted ever since.

The Colonial Office and the British Parliament, prior to this, had their attention repeatedly directed to the condition of the Colony and the unpopularity of Lord Somerset's administration. In 1822, the House of Commons agreed to an address for the appointment of a Royal Commission to enquire into the state of the Colony as far as regards its revenue, its institutions and the conduct of its Governor. Messrs. Bigge, Colebroke, and Blair, formed this Commission, and they were engaged with their labours until 1826; but before their reports were finally completed, permission was given to Lord Charles Somerset to return to England, ostensibly to rebut some of the charges brought against him, but really to prepare for retirement from office. During the period of his Administration, he exercised an absolute despotism, tempered by favouritism, in matters both political and social; but he took an active interest in the material development of the Colony, giving personal encouragement to the improvement of the breed of horses, cattle, and sheep by the importation of the best stock. And if "he who makes two blades of grass grow where only one grew before," deserves well of a country, Lord Somerset will be gratefully remembered for having set in motion the emigration scheme of 1820, which introduced a population whose energy has spread out in manifold enterprises throughout all South Africa.

The reports of the Commissioners of Enquiry were in due time in the hands of the Imperial Government, and led to the introduction of many changes, which went chiefly in the direction of

anglicizing the Colony. An Executive Council was appointed to assist the Governor with advice in matters of importance or difficulty. A Supreme Court of Justice, consisting of a Chief Justice and three Puisine Judges, was established by Royal Charter. A Circuit Court, presided over by one of the Judges, was to sit in every district of the Colony once in every six months. Magistrates were placed in charge of divisions, and to hold court in every district town twice a week, or as often as was necessary,—taking the place of the old courts of landdrost and heemraden, composed chiefly of the burgher inhabitants. Justices of the peace were appointed in some of the towns and hamlets. And, simultaneous with these changes, the English language was ordered to be used in all official proceedings and business.

Major-General Bourke, who succeeded Lord Somerset in 1826, was originally selected to exercise the functions of Lieutenant-Governor of the Eastern Districts, as it was then intended to create these districts into a separate and distinct government. This was in accordance with a recommendation of the Royal Commissioners, who urged the importance of applying uniform and consistent principles to the intercourse of the colonists with the Kafir and other tribes. But the plan was afterwards modified; and a Commissioner-General appointed (Mr. Stockenstrom being chosen for the office) to superintend the affairs of the border.

At this time, a state of panic arose among some of the frontier Kafir tribes, owing to their being threatened with invasion by marauding hordes of what were termed the "Fetcani." The "Fetcani" proved to be a tribe of Zulus known as the Amangwane, under the chief Matiwane, who, in the native revolutionary wars caused by Chaka, fled southward, overpowering and conquering their neighbours, and finally threatening the destruction of the Tembus and Galekas on the colonial border. Governor Bourke promptly resolved to aid the Kafirs in repelling these invaders, and a force of burghers under Col. Somerset, together with the Kafir chiefs and their people, defeated and dispersed them near the Umtata, in 1828. Among the burgher commando on this occasion were some of the young Albany settlers, to whom the service was as novel as it was unexpected.

Many of the dispersed tribes seeking refuge along the border of the Colony, Major-General Bourke deemed it advisable to pass an ordinance to legalise their admission, under certain restrictions, as free labourers, and to regulate the terms of their employment. At the same time he gave attention to the improvement of the condition of the Hottentots, and after consulting with the Rev. Dr. Philip, of the London Missionary Society, and Mr. Stockenstrom, who were acquainted with these people, he framed the Ordinance No. 50, for consolidating and amending the laws

respecting them. Of this enactment, the Governor wrote, "I thought it right to promulgate it immediately after the Ordinance No. 49, lest it should seem that more care was taken for the protection of foreigners than for the welfare of the ancient inhabitants of the Colony." The enactment was ratified and confirmed by an Order in Council dated from Windsor, the 15th January, 1829, which declared that " all Hottentots and other free persons of colour lawfully residing within the Colony are in the most full and ample manner entitled to all and every right, benefit and privilege to which any other British subjects are entitled." This was the Magna Charta of the colonial aboriginal races.

In 1828 the Chief T'Slambie died, having lived to a great age; and in the following year, the Chief Gaika passed away, having hastened his end by intemperance. His heir, Sandilli, being a minor, the mother, Sutu (who still survives, residing at Umgwali Mission Station, Stutterheim), became Regent, and Macomo and Tyali, elder sons, were appointed to assist her. The ceded territory between the Fish and Keiskamma Rivers, was still in a great measure unoccupied, with the exception of the Kat River Valley, where Macomo and his followers had been allowed during good behaviour to reside. But in 1829 they broke the peace by attacking a tribe of the Ama-Tembus living behind the Katberg, pursuing some of them into the Tarka District, within the Colony, and slaughtering them there. For this outrage, Macomo and his people were removed eastward of the Chumie River; but the chief never ceased to look back with covetous eye on the Eden from which he had been expelled. The Commissioner-General, Mr. Stockenstrom, then suggested that the country so vacated should be filled up with the descendants of the Hottentot race, scattered about the country, and sanction was given to the scheme by the Governor, Sir Lowry Cole. The beautiful fertile valleys of the Kat River were laid out in locations, on which the Hottentots were placed, each family receiving a certain number of acres of arable land as their allotment, and the pasturage being reserved as commonage for the community.

Early in 1834, Sir Benjamin Durban arrived as Governor. The revenue of the Colony for some time before had been inadequate to meet the charges of the civil establishments, and the Home Government ordered extensive reductions to be made. The Governor's emoluments were fixed at £5,000, without any allowances; the Commissioner-General's office was abolished; and every official's salary, from the Chief Justice down to a junior clerk, was subjected to some reduction. At the same time, the Governor had to give effect to the Act for the emancipation of the Slaves, which had passed the Imperial Parliament in 1833.*

* In 1833, the total number of slaves in the British Dominions was 780,000, valued

He had to initiate the new Legislative Council which had been granted to the Colony. He was also directed to devise new measures for the protection of the border, and to cultivate the goodwill of the chiefs, by having qualified men stationed with them as agents. While he was detained in Cape Town, preparing and maturing his plans for giving effect to this policy, the frontier of the Colony was suddenly invaded by hordes of Kafirs.

The expulsion of Macomo from the Kat River was followed, in 1834, by the ejectment of some of Tyali's people from the Gaga River, and their removal across the Chumie River. Numbers of them, however, persisted in going back and re-occupying the country. The military patrol, charged with the duty of removing them, destroyed their kraals and seized some milch cows; a skirmish ensued, and a brother of Tyali, named Klu-Klu, was slightly wounded. "The blood of a chief had been shed." Macomo, and Tyali, who were exasperated with the Government, made this a cause of war, and fired the train already laid. Botma and Eno were joined with them, and they were supported and countenanced by the large tribe of Gcalekas, under Hintza. Before the morning of the 23rd of December, 1834, ten thousand Kafirs rushed over the border, like troops of wolves, carrying terror and death into the homes of the astonished and unoffending settlers. The inhabitants, living on widely separated farms, had no warning, and could offer no resistance. Within a week, fifty farmers were slain, hundreds of homesteads were burned down, and loads of spoil, consisting of horses, cattle, goats, sheep, clothes, and whatever could be laid hold of, carried off into Kafirland.

The defensive power of the Colony was at the time scanty, but all available forces were mustered under Col. Smith (afterwards Sir Harry Smith), who rode the distance to Graham's Town, about 600 miles, in six days after news of the rising reached Cape Town. The enemy's territory was entered, and after several months' fighting, the Kafirs were subdued. As an indemnity for the past and a security for the future, a proclamation was then issued by Sir Benjamin Durban, declaring British sovereignty to be extended over the territory of the tribes as far as the Kei River. The people were not to be removed from their lands, but governed, restrained and improved upon them, by the gradual introduction of British law and order. At the same time, a number of natives named Fingoes, remnants of the Fetcani refugees, who were in a state of servitude under the Gcaleka Kafirs, and had

at £45,000,000. The number in the Cape Colony was 35,700, appraised at £3,000,000, and of the grant of £20,000,000 voted by Parliament, for the emancipation of the slaves, the amount apportioned to the Cape was £1,200,000. The first day of December, 1838, witnessed the freedom of all the slave and indentured class in the colony.

kept aloof from the war, were brought out of Kafirland, and located in the country between the Keiskamma and Fish Rivers.

But the Governor's proclamation extending the colonial border to the Great Kei River, was unfortunately disapproved of in England, and ordered to be reversed—the allegiance of the chiefs and tribes who had submitted being renounced, and the limits of colonial authority moved back to where it was prior to 1819, along the dense thickets of the Fish River.

Against this reversal of his policy, Sir Benjamin Durban stoutly protested; he declared "it is one which so sure as certain causes must produce certain effects, cannot fail to be pregnant with insecurity, disorder and danger." His expostulation with the Secretary of state (Lord Glenelg) on the subject, caused his dismissal, and brought his public services in the Colony to a close. His retirement from office, however, called forth an universal expression of regret, as well as substantial tokens of affection and gratitude on the part of the colonists.

Previous to this time, various causes had contributed to create dissatisfaction in the minds of many of the old Cape Dutch Colonists; and they began "trekking" or moving away into the interior, with the avowed object of getting beyond the control and jurisdiction of the British Government. In 1825, silver coinage was made a legal tender in all the British possessions, the rate of exchange for the paper rix-dollar at the Cape being fixed at 1s. 6d. sterling; and this was regarded by many as a breach of the pledge given by Government for the redemption of the colonial paper currency. Soon afterwards, in 1826, the promulgation of the law for ameliorating the condition of slaves created a considerable sensation among them. In Cape Town, the Burgher Senate declined to give publicity to it in the usual form by reading it aloud from the Town-house, and finally it was only read by the President alone (who afterwards tendered his resignation), none of the members of the Senate attending. In the district of Stellenbosch and elsewhere, the same opposition and delay occurred, none of the Heemraden chosing to attend. Afterwards, when the Slave Emancipation Act was promulgated, the slave owners bitterly complained that the Government, which for years previously imported and encouraged the sale of that species of property, enjoying the taxes and emoluments therefrom, should now arbitrarily deprive them of it. They also regarded the compensation offered as inadequate and unjust; and some of them refused to take any of the money, of which £5,000 has remained unclaimed to the present day. To these and other causes of discontent were now added the losses sustained during the war, and the inadequate protection afforded the border inhabitants against the Kafirs by the policy of the English Government. This

intensified the feeling of dislike entertained by many of them to rulers whose nationality differed from their own.

During 1835-37 the exodus of these people went on. The number who voluntarily expatriated themselves has been variously estimated at from 5,000 to 10,000. They sold their properties for whatever they could realise—many a good estate being hastily exchanged for a wagon and team of oxen, and some for even less value,—and went off with their wives and children into what was then the wilderness north of the Orange River. The story of their adventures and exploits, under their leaders—Retief, Maritz, Potgieter, Uys and Pretorius; their encounters with the savage hordes of Moselekatze and Dingaan, by whom they were treacherously assailed; and their final settlement in Natal, the Orange Free State and the Transvaal Republic, forms one of the most stirring and romantic chapters of modern history.*

But we must revert to events in the Cape Colony. By the policy of Lord Glenelg, the Kafir chiefs were reinstated as masters of the country between the Great Fish and the Kei Rivers, with the exception of the Hottentot settlement at Kat River and the Fingo settlement on the lower course of the Fish River. Mr. Stockenstrom was appointed Lieutenant-Governor, with instructions to establish by treaty the new system of relations with the natives—the rules guiding him being, the abolition of the commando and reprisal system of 1817; the acknowledgment of the independence of the tribes within their own territories; the appointment of British Agents to reside near to the chiefs, and all complaints from colonists or natives to be made through them; the chiefs agreeing on their part to find and restore, or give compensation for, any property stolen from the Colony, and to protect traders and Christian Missionaries residing with their leave in Kafirland.

Some modifications of these treaties were made by Governor Sir George Napier, who held office until 1844, and also by his successor, Sir Peregrine Maitland, who secured for converts to Christianity in Kafirland the liberty to settle at missionary institutions, and freedom from persecution for non-compliance with Kafir customs.

The Chief Sandilli had by this time come of age, and was surrounded by a war party eager to test their strength against the colonists. In 1846 a Kafir of his tribe was being sent from Fort Beaufort to Graham's Town for trial, on a charge of theft of an axe, when he was rescued by some of his countrymen, and another prisoner to whom the Kafir was fastened was cruelly

* A valuable compilation of the Annals of Natal, for the period A.D. 1497-1845 inclusive, containing almost every available record relating to the Boer Exodus, has just been completed for the Natal Society, Pietermaritzburg, by the Honourable John Bird, late Treasurer-General of that Colony.

mutilated and murdered. The surrender of the parties concerned in this outrage was refused, and war was declared by the Governor. The military force advancing into Kafirland met with a reverse near Burnshill, having to retire and leave in possession of the Kafirs a lengthy wagon train, containing the baggage of the 7th Dragoon Guards. All the available forces of the Colony were then again called into the field,—Sir Andries Stockenstrom being at the head of the burghers, and Sir John Molteno, Messrs. Onkruydt, Joubert, Pringle, and Du Toit, among his commandants. The Kafirs were routed out of their strongholds in the Amatola Mountains; Sandilli surrendered the parties concerned in the outrage on the Colonial prisoner; and Kreli, the Gcaleka Chief, acknowledged the British right by conquest to all lands west of the Kei River. In 1847, Governor Maitland was superseded by General Pottinger, and he in turn was relieved by Sir Harry Smith, who, as Governor and High Commissioner, in 1847, proclaimed the boundaries of the Colony to be the Kieskamma River on the east, thence across the Stormberg to the Kraai River, and thence along the Orange River to the sea on the west. He also proclaimed British sovereinty over that portion of Kaffraria between the Keiskamma and Kei Rivers, as had been done twelve years before by Sir Benjamin Durban.

The peace of 1847 did not last long. The chiefs, dissatisfied with the loss of their power, supported a witch-doctor, named Umlanjeni, who made his followers believe he had the power to turn the Englishmen's bullets into water. Sandilli was called to account for countenancing this imposture, and failed to appear before the Governor. For this act of contumacy he was, by proclamation, deprived from his rank as chief. The Kafirs at once resumed hostilities. On the 24th December, 1850, they attacked a military force in the Boomah Pass; and on the following day massacred a number of military settlers, who had been located in the Chumie Valley, and who, in fancied security, were preparing to celebrate the usual Christmas festivities. The Governor himself was, for several days, surrounded by the enemy, and shut up in Fort Cox, and at last only escaped by dashing out with an escort of Cape Mounted Rifles and vigorously riding on to King William's Town. To add to the difficulties of the position, several natives serving in the Cape Corps, and many of the Kat River Hottentots, who on former occasions sided with the colonists, and helped the colonists against the Kafirs, now revolted and joined the latter, forming marauding bands, attacking the homesteads and properties of their former friends and employers.

The war was a protracted and costly one; and in 1852 the Home Government, dissatisfied with its progress, recalled Sir Harry Smith and appointed General Sir George Cathcart as Governor

and Commander-in-Chief. He brought hostilities to a close in 1853. The Gaika tribe, under Sandilli, were removed from the Keiskamma and Amatola, and placed eastward of the Thomas River, their former possessions being filled up by a settlement of Fingoes and other natives, who had proved their loyalty to Government during the war; while a portion of the Ama-Tembu territory was declared forfeited, and created into a new district, named "Queen's Town," its lands being occupied by a burgher population, under an organisation for mutual support and defence.

This long series of Kafir wars contributed to give the Cape a bad name, causing it to be regarded as an undesirable place for settlement, and subjecting the Colonists to the groundless and unjust imputation that they were enriching themselves by the military expenditure incurred at the expense of the Imperial Government. These wars and disturbances were really ruinous to all classes of the inhabitants, and greatly retarded the advance and development of the country itself.

The Colonists had not, at this time, any share in the management of their own affairs. The Legislative Council was a nominee body, its constitution being based upon the principle of representation by election of the Crown. The public began to realise that while their interests were often materially affected by its proceedings, they were excluded from all influence upon its action. Petitions for an elected House of Representatives had been presented to the Secretary of State as early as 1827; and applications for the privilege of representation by the people were renewed at various periods after that, until, in 1849, an intimation was received that the Home Government was favourably disposed to entertain the matter. At this time an event occurred which brought the Colony into some prominence, and obtained for it the respect if not the applause and approval of almost every other colony of the British Crown.

The Secretary of State, Earl Grey, proposed to turn the Cape into a penal settlement, and directed three hundred convicts, some of whom were Irish political offenders, to be removed from Bermuda to Cape Town. As soon as this became known, memorials and petitions from all parts of the country, remonstrating and protesting against the action, poured in upon the Governor. The Colony from its first settlement was free from the taint of convictism, and the people were infuriated at the idea of their country being degraded and their characters tarnished by its conversion into a penal station. They also reasonably dreaded the evils which might ensue if felons and bush-rangers once got intermixed with the uncivilized natives along the borders. When the ship *Neptune*, freighted with the convicts, arrived in Simon's Bay, the spirit of the Colonists was fairly aroused. Meetings were held in

the open air; petitions to the Queen, to the two Houses of Parliament, and to the people of England were adopted; and the community entered into a solemn league and pledge to suspend all business transactions with the Government, in any shape or on any terms, until the order making the Cape a penal station was reversed, and the convict ship was sent away. This method of "passive resistance"—more recently known as "boycotting"—was soon put into operation, and the Government found nearly all its ordinary channels of supply stopped. Such was the popular feeling in favour of the "pledge," that even any suspicion of being concerned in dealing with the Government, or rendering it supplies in any form, placed a man under the ban of social excommunication. The struggle was prolonged for fully six months; but the determined stand made by the Colonists was successful. Earl Grey confessed that he had committed an error; and in February, 1850, an Order in Council was issued revoking the former one by which the Cape was named as a penal settlement, and the ship *Neptune* with the convicts sailed out of Simon's Bay for Van Dieman's Land.

The satisfactory issue of this contest stimulated the desire of the Colonists for Representative Government, and Mr. Fairbairn and Sir A. Stockenstrom were deputed to proceed to England to vindicate the rights and interests of the Colonists before the British Parliament and people. By letters patent, dated 23rd May, 1850, the Governor and Legislative Council were empowered to enact Ordinances for the establishment of a Representative Government, consisting of two elective Chambers; and three years later that form of Government was brought into force. The first Parliament met and was formally opened by Lieutenant-Governor Darling on the 1st July, 1854.

In the same year, Sir George Grey, who had previously very successfully administered the affairs of South Australia and New Zealand, was appointed Governor and High Commissioner. He at once asked Great Britain to vote £40,000 per annum, to defray the cost of public works, to subsidise some of the chiefs, and to maintain educational and benevolent institutions, so as to promote civilization amongst the Kafir tribes. He held out the prospect that in eight or ten years' time, the mother country might be relieved from the constant anxiety and expense which the Cape frontier had for a long period entailed. Her Majesty's advisers agreed to the proposal of the expenditure of £40,000 from Imperial funds, and the Cape Parliament voted a sum of about £50,000 for the equipment and maintenance of a police force for the security of the frontier and its inhabitants. A further development of Sir George Grey's policy was to improve the tenure on which the native people held their lands, giving them a vested

interest in the soil; and also to open up their country to commerce by constructing roads, which would be of equal use in peace or war—the Kafirs being employed on these road-works, and thus acquiring habits of labour which they had formerly never known.

Meanwhile a political movement of a most singular character was in progress in Kafirland. A Kafir seer, Umhlagaza, arose among the Gcalekas, under the patronage of the chief Kreli; and, professing to have held converse with the departed Kafir heroes and chiefs, he conveyed a message from them to all Kafirs to destroy their cattle and corn, and refrain from cultivating the ground, assuring them that when these orders were carried out a new state of things would follow—the past heroes and all the dead of the Kafirs were to arise, all cattle would also be restored to life, and the white man and Fingoes would be swept from the face of the earth. It is inconceivable the extent to which these predictions were believed and acted upon. Thousands upon thousands of fine cattle were slaughtered. In the Gcaleka country, Kreli gave the word that the spirit of their ancestors must be obeyed, and such quantities of corn and cattle were destroyed that hunger began to make havoc among the ranks of his followers.

This was a critical time for the peace of the frontier. The political aim of the delusion was to incite the people, after they had destroyed their means of subsistence, to make an onslaught on the Colony; but there was not that simultaniety of action among them to ensure success. While the Gaika chief was considering what he should do, the other tribes were broken and starving. It was thought by many that Government should have interfered and apprehended the prophet and his patrons, but such a step would probably have precipitated war. Every means, however, were adopted that could be devised to protect life and property in the Colony, and to be prepared for the worst. As soon as the crisis was passed, those of the natives who survived the delusion were fed by the Government and private charity; and the Colonists benevolently came forward and co-operated with the authorities in relieving the sick and suffering, and saving the remnant of the nation, as far as possible, from the consequences of its mad act of self-destruction. It was estimated that 25,000 Kafirs, chiefly women, children and aged persons, perished, and that nearly 100,000 disappeared for a time from the country, driven out by the famine which they had themselves created.

One result of this depopulation of the country was that large tracts in British Kaffraria were cleared of their former occupants. The Governor filled up some portions of these with European farmers from the Colony on a system of military tenure. The Anglo-German Legion, disbanded after the close of the Crimean War, were also introduced and located there—the Cape Colony

contributing towards the expense of bringing them out. And shortly afterwards a body of agricultural labourers, with their wives and children, to the number of two thousand, from North Germany, were introduced and settled in the neighbourhood of the military villages along the Buffalo River.

While these matters of frontier policy more immediately occupied Sir George Grey's attention, he was not neglectful of other interests affecting the welfare and prosperity of the Colony generally. In Australia he had witnessed the extraordinary development which followed from a systematic introduction of immigrants, and from what he had seen of the Cape of Good Hope, he was satisfied that it offered at least equal advantages as a field for the profitable employment of industry, as well as of capital in the occupation of lands. He proposed a scheme to Parliament for raising a loan for immigration purposes, which was sanctioned. He also devised various plans for developing the internal resources of the country. In 1857, authority was given for the construction of the first line of railway from Cape Town to Wellington. Roads and bridges, in various directions, were authorised; and measures were passed for promoting a harbour of refuge in Table Bay, and for the construction of harbour works at the mouths of the Kowie and Buffalo rivers. New divisions were created, additional magistrates appointed, and numerous new villages rapidly sprung up, forming centres of population throughout the country.

The commerce of the Cape, during the ten years following the re-establishment of peace and the first meeting of the Parliament, indicated a remarkable development of its resources. In 1854, its exports were valued at £764,461. In 1864 they were more than trebled, amounting to £2,594,594. The quantity of wool produced increased from 8,567,457 lbs. in 1854, to 36,296,698 lbs. in 1864. The imports of goods in 1854, were £1,548,037, and in 1864 they had advanced to £2,471,339.

Sir P. E. Wodehouse succeeded to the Governorship in 1862. An Imperial policy of economy in all expenditure upon the Colonies was then being adopted, and he was instructed to use all means to make British Kaffraria self-supporting, or to incorporate it with the Cape. The Kaffrarians, however, resisted annexation, as they wished to retain their separate government, and the colonists opposed it, from an apprehension that they would be burdened with the expense of the general military defence of the Kaffrarian frontier, of which they could see no precise limit. The Governor suggested to the Secretary of State that if it was desired to unite the two colonies, it had better be done by an Act of the Imperial Parliament. This suggestion was adopted, and an annexing Bill was introduced into the House of Commons and became law—but it contained a provision that the Cape Parliament might, if so

disposed, pass another enactment arranging details, before it came into operation. This proceeding was regarded as a violation of the constitutional rights of the colonists; but the Imperial Act being held *in terrorem*, the Cape Legislature accepted the position, and, after a severe struggle of parties, in 1865, agreed to a Bill incorporating British Kaffraria with the Colony, and increasing the number of constituencies entitled to representation in the Assembly, as well as enlarging the Legislative Council.

The tract of country beyond the Great Kei River was at this time almost unoccupied, having been depopulated during the famine of 1857, and the chief Kreli expelled beyond the Bashee River, as a punishment for the evils he had caused in Kaffraria. Sir G. Grey had filled up a small portion of it with friendly natives, Kafirs and Fingoes, placed under European magistrates; and he proposed occupying other parts with a European population reared in the Colony, and holding their lands on a system of military tenure, similar to the Cathcart grantee system in Queen's Town. Governor Wodehouse proposed a similar scheme for its settlement, with the addition that an armed force should be organised for the defence of the new frontier. But the Secretary of State, apprehending that such an occupation would increase the risk of further Imperial expenditure, directed British authority to be withdrawn, and the Kei River made the colonial boundary.

Sir Philip Wodehouse thereupon granted Kreli permission to return with his followers to a portion of the vacant territory; while the remainder of it was allotted to Fingoes and Tembus, who crowded some of the Frontier districts, and whose excessive population was thus drawn off. The transfer of these natives from within the Colony was finally carried out in 1866, and the fertile country, now known as the Transkei, became peopled with portions of Fingo and other tribes, having no alliance with their Gcaleka neighbours, and believed to be friendly and loyal to the British Government, from a consciousness of benefits received and an appreciation of the peace secured to them by its influence.

Some important questions occupied public attention during the administration of Governor Wodehouse. One was the long continued but unsuccessful agitation for a division of the Colony into two separate governments. Another was the unsatisfactory relations between the Executive Government and the Legislature. By the Constitution granted in 1853, the Parliament was composed of representatives elected by the people, while the members of the Executive, who held seats in both Chambers, were appointed by and responsible to the Imperial Government. The remedy for this was a change to the system of responsible or party Government; but to such a change a majority of the colonists were

opposed, considering it to be premature and unsuited to the country. Between 1867 and 1869 the finances showed a marked decline, and to equalise revenue and expenditure, a large scheme of taxation was submitted by Government. The House of Assembly resolved that instead of this taxation there should be considerable retrenchment of the public expenditure. Matters threatened to come to a deadlock. Sir Philip Wodehouse reported the Constitution to be unworkable. He dissolved Parliament, and, with the approval of the Secretary of State, made an appeal to the country at the elections,—the issue being whether the Legislature should be modified, as Sir Philip proposed, so as to consist of a single chamber of thirty-six members, giving the Executive increased powers; or whether the Colony should have the administration conducted as in England by a Cabinet possessing the confidence of the Legislature. When the new Parliament met, it at once rejected the reactionary proposal of the Governor, and his period of service being completed he left the Colony.

Governor Sir Henry Barkly, experienced in the working of constitutional Government in Australia, was then sent out, with authority to press the adoption of full self-government upon the Colony, which he did with success. In 1872, he introduced a measure, which, after five days' debate, was passed in the House of Assembly by a majority of ten votes, and in the Legislative Council by a bare majority of one. The new constitution thus created was assented to by the Queen and proclaimed on the 29th November, the first Ministry being formed by Sir John Charles Molteno.

Following upon the inauguration of Responsible Government there was another marked advance of the prosperity of the Colony. Shortly before there had been a long period of adversity. Abnormal seasons and protracted droughts had occasioned great loss of sheep and cattle; the wine farms were devastated with *oidium*; and the wine trade itself was universally depressed, as Mr. Gladstone's alcoholic scale of duty excluded it from the English market. Added to this, a war on the border, between the Orange Free State and the Basuto tribe, disastrously affected colonial business. But just at the time when the prospects of the country were most gloomy, a change in its fortunes occurred. Diamonds were found along the banks of the Vaal River; and the success of the first search parties brought numerous others from the neighbouring colonies and republics, as well as from abroad. The rich mines of Griqualand West,* which were then opened, gave employment to large bodies of men; and this, combined with a return of favourable seasons, reacted upon the agricultural and pastoral classes throughout the whole Colony, producing such beneficial effects that the public re-

* An epitome of the History of Griqualand West will be found in the chapter on "Diamond Mining at the Cape."

venue, which had previously exhibited deficits, shewed for several years an uninterrupted annual increase and a handsome surplus over each year's expenditure. In 1874, the exports of the Colony (which in 1854 were only £764,461), amounted in value to £4,233,561, exclusive of a large unregistered exportation of diamonds, estimated in that year at £200,000. The export of wool reached 42,620,481 lbs., of the value of £2,948,571. The imports in the same year advanced to £5,558,215, the greater part of which were from Great Britain, and the public revenue which in 1854 was only £300,000, rose to above one million and a half sterling The census of the Colony taken in 1875, shewed that the total population numbered 720,984 persons, of which the European or whites amounted to 236,783, and the various native and coloured classes to 484,201. The total area of holdings was close upon eighty million acres, of which about sixty millions were held upon quitrent tenure, over eighteen millions on leasehold, and a million were freehold properties. The number of different kinds of live-stock was:—Sheep (woolled), 9,986,240; other sheep, 990,423; horses, 205,985; mules and asses, 29,318; draught cattle, 421,762; other cattle, 689,951; angora goats, 877,988; other goats, 2,187,214; pigs, 116,738; ostriches, 21,751.

Twenty years of peace had almost lulled the Colony into forgetfulness of native disturbances and war, when in 1876 rumours began to spread of "looming troubles" owing to the restless state of some of the Kafir tribes. Although the feeling of insecurity was attributed to groundless "scares," Sir Henry Barkly, with the advice of his ministers, appointed a Commission to consider the question of frontier defence. This Commission, after taking the evidence of military and other officials, brought up a report, stating that "the Colony was living upon a mine that might at any moment be sprung beneath its feet." Different opinions prevailed as to the extent of the danger, but the Government felt it to be its duty to strengthen the defensive forces of the country.

In 1877, Sir Bartle Frere was appointed Governor, in succession to Sir H. Barkly, and was charged as High Commissioner with the supervision of British interests in Griqualand West, in Natal, and South Africa generally. On his arrival, he loyally co-operated with the ministry of Sir John Molteno, then in office, and made arrangements, after meeting Parliament, for visiting the frontier. Just at this time, the accident of a fight at a wedding feast in the Transkei set the tribes on the border in commotion. Some Fingoes had been beaten and one Gcaleka killed. This revived the old animosity which had existed for many years between these two tribes.

The Gcalekas entered Fingoland at four points, sweeping off cattle from the Fingo villages, and one of their armed parties

attacked the Mounted Police Force at Gwadana, killing one officer and four men. Measures were at once taken by the Government for the protection of the Fingoes and the punishment of their enemies. The Colonial Forces and Volunteers from the principal districts and towns, as well as two of H.M.'s infantry regiments, a naval brigade, and artillery, were brought into the field, and Kreli and his forces were defeated and driven over the Bashee River. It was thought the disturbance was then at an end; but the Gcalekas shortly afterwards reappeared in considerable force, and a body of them crossed the Kei River into the Gaika territory, and induced that tribe, under the chief Sandilli, to engage in hostilities. A portion of the Gaikas, however, remained faithful to the Government, as did many of the smaller tribes. After a few months' fighting, the war was brought to a close by the dispersion of the Gcalekas, the death of the Gaika chief, Sandilli, and the surrender or capture of the minor Gaika and Tembu chiefs who took part in the rebellion. The Gaika territory was declared forfeited, with the exception of the several Christian mission stations; and the remainder of the Gaika tribe was removed across the Kei, into a portion of the fine country left vacant by the dispersion of the Gcalekas. Kreli was outlawed, but took refuge in Bomvanaland; and, after seven years' life "in the bush," he has now been pardoned by the Government, and permitted to settle down as a peaceful subject in a portion of that district.

During the course of the war, in the early part of 1878, the Governor and his Ministers unhappily were not in accord—the point of difference between them having reference to the control of the forces in the field, and who should conduct the operations for the suppression of the rebellion. The Governor ultimately dismissed Sir John Molteno and his colleagues from office, and summoned Mr. John Gordon Sprigg to form a ministry, which was at once done. Parliament was assembled shortly afterwards, and the action of the Governor was challenged in the House of Assembly, but after a long debate, the House resolved by a majority of 37 to 22 that, under all the circumstances of the case, the removal of the Ministers was unavoidable.

Parliament, before it arose, voted its thanks to the Officers Commanding and to all the forces, regulars and colonial, who had been engaged in the suppression of the rebellion. It also made provision for the self-defence of the Colony in the future, by sanctioning considerable votes for increasing the Cape Mounted Police, and passing laws for the organisation of a Yeomanry Corps, Volunteers, and the Burgher and Levy forces—the latter embracing every able-bodied man in the Colony between 18 and 50 years of age, with some necessary exceptions. It likewise gave the Govern-

ment the power to proclaim areas, within which it would not be lawful for any persons to have arms or weapons without a licence. Under this Peace Preservation Act, as it was termed, the Kafirs and Fingoes on the Frontier and in the Transkei were disarmed of their guns and assegais, compensation being allowed them for the same; and an intimation was given that the law would also be extended to the Basuto tribe, occupying the territory of Basutoland.

This tribe, as already mentioned, had been at war with the Orange Free State in 1868, and were on the point of being entirely subjugated and broken up, when Sir Philip Wodehouse, in his capacity of High Commissioner, stepped in and saved them by proclaiming British sovereignty over them. In the Free State and in some parts of the Colony, at the time, the interference was regarded as an unwarrantable act, but it was approved of and confirmed by the Imperial Government. For a year or two afterwards, the territory was held by the Cape Mounted Police Force; and in 1871, before the introduction of Responsible Government, Parliament was induced, at the instance of Governor Sir H. Barkly, to annex it to the Colony, which became responsible for its expenditure and administration. From this period, the tribe made marked progress in material prosperity and civilization, and their government by European magistrates under Col. Griffith, C.M.G., was deemed to be a success.

There were some of the chiefs, however, who chafed under the control of the Magistrates; and in 1879, Moroisi, a Bahputi chief, defied the authorities and went into rebellion. His death and the forfeiture of his lands followed. The Basutos, some of whom had aided in the suppression of the revolt, were troubled about this confiscation of territory; and when the extension to them of the Peace Preservation Act was announced, their chiefs seized the occasion of arousing and influencing the tribe to oppose it. The feeling against the disarmament policy was further encouraged by the statement, made through the ordinary public channels, that the Colonial Ministry was not supported by the Home Government. On the issue of the disarming proclamation, some loyal people obeyed the order, and surrendered their arms; but the fact of their doing so drew upon them the enmity of the chiefs, who according to native custom "ate them up," threatening their lives and carrying off their cattle. A troop of the Cape Mounted Riflemen then moved up to Basutoland, for the protection of the loyalists. They were met on the border by armed forces of the Basutos, who essayed to resist their entry, and afterwards in great numbers attacked their camps and the magistrates' stations. In September, 1880, nearly the whole tribe was in revolt; and within a week or two afterwards, there was a rising of the Basutos in East

Griqualand, followed, by that of the Pondomise, Amaquate, and Tembus, and other tribes east of the Drakensberg. This rising was signalised by the treacherous murder of one of the magistrates, Mr. Hamilton Hope, who was stationed with the Pondomise chief Umhlonhlo. The chief volunteered to go with Mr. Hope to aid the Government; but, when on the way, the Pondomise, forming a semi-circle, began a war dance, supposed to be loyal, the warriors of the tribe making, as is the custom, feints at stabbing, when they suddenly rushed at Mr. Hope and two of his companions, Warrene and Henman, killing them on the spot.

At this time, Sir G. C. Strahan was temporarily administering the Government, in succession to Sir Bartle Frere, who had been recalled owing to the divergence between his views and that of Her Majesty's Government on the affairs of South Africa. Sir G. Strahan issued a proclamation, calling out 2,000 of the burgher forces, and these together with Volunteers and auxiliary Corps from all the principal towns, were at once sent to the front, and in a comparatively short time the outbreak in Griqualand East and Tembuland was suppressed. Afterwards, strenuous efforts were made to reduce the Basutos to submission by force of arms, but without success.

In 1881, Sir Hercules Robinson arrived as Governor and High Commissioner, and he was instructed to offer his services as mediator between the Colonial Government and the Basutos. Both being willing to accept his arbitration, His Excellency gave his award on the 29th of April— the terms being a surrender of guns by the Basutos, and liberal issue of licences to carry arms on payment of a licence fee; restoration of the property taken from the loyals; compensation to traders for loss of property; and payment of a fine of cattle by the tribe. These conditions being complied with, there was to be a complete amnesty, and no confiscation of territory. A few days after this, the Hon. Mr. Sprigg and his colleagues resigned office, and a new Ministry was formed under the Premiership of Sir Thomas Scanlen.

Although the award of Sir Hercules Robinson was accepted by the Basutos, and some cattle paid as a fine, little was done towards fulfilling its other conditions. After the lapse of about twelve months, the award being still uncomplied with, it was cancelled. A Commission was then appointed to assess the losses sustained by the loyal Basutos, and to compensate them for the same out of funds voted by Parliament; the disarmament proclamation was also withdrawn; and nothing was required of the Basuto tribe than payment of hut-tax and ordinary obedience to the law. Yet all these conciliatory efforts to re-establish the Government of Basutoland on a satisfactory footing proved unsuccessful. There was, meanwhile, a growing colonial feeling in favour of

the abandonment of the territory; and the Ministry deputed one of their colleagues, the Hon. Mr. Merriman, to visit England and place the whole matter before the Imperial Government. In view of the disastrous effect which the abandonment of Basutoland might produce, the Imperial Government decided to undertake the administration of the country, on certain conditions—one being that the Colony paid towards the cost of its government an equivalent to the amount of customs duties received on goods sent into the territory; the other being that, if the Basutos did not give proof of their appreciation of British intervention, by assisting the administration in every way, the Imperial Government would not hold themselves bound to continue it. This arrangement, with a slight modification, was accepted by the Colony; and an Act for the Dis-annexation of Basutoland was passed in 1883, making provision for the payment of a sum, not exceeding £20,000, as a contribution towards any deficiency that may arise in the revenue of Basutoland. The territory is now governed by a Resident Commissioner, who is under the direction of Her Majesty's High Commissioner in South Africa.

In 1883, the Colonial Parliament expired by effluxion of time, and on the meeting of the new Parliament after the elections, in 1884, the Ministry of Sir Thomas Scanlen intimated their intention of asking the Legislature, by resolution, to cause enquiry to be made whether the Imperial Government would not assume direct control over the Transkeian territories, as well as over Basutoland; but before this could be carried out, they found themselves defeated on a motion respecting the prohibition of the introduction of plants under the Phylloxera Prevention Act. Sir Thomas Scanlen accepted this as a non-confidence vote, and resigned. A new Ministry was then formed under the Premiership of the Hon. Thomas Upington, Q.C., who announced that his Cabinet considered the policy of retrocession of the Transkeian territories unadvisable, and that they were prepared to submit proposals to complete their annexation.

They had, however, first to deal with the question, which suddenly arose, of a German Protectorate being established on the border of the Colony north of the Orange River, along the West Coast. Some years before this, Sir Bartle Frere had recommended the annexing of this coast right up to the Portuguese boundary at Cape Frio, but the Imperial Government took no action in the matter, beyond sanctioning the British flag being hoisted at Walwich Bay and a small piece of ground surrounding it. A German subject, Mr. Luderitz, had in the meantime acquired rights of property at Angra Pequina Bay, and his Government, through the German Ambassador in London, enquired of the Secretary of State whether British protection would be extended

to Mr. Luderitz, intimating that failing British action, Germany would itself take its subjects at Angra Pequina under protection. The Secretary of State communicated with the Colony, enquiring, if the place was declared British, whether the Cape would be prepared to take the responsibility and control of it. When the matter was submitted to the Cape Parliament, it at once passed resolutions in favour of the annexation of the whole coast up to the Portuguese boundary. But in the interval, during which this reference to the Colony was made, a German man-of-war made its appearance and proclaimed a Protectorate over the coast from the Orange River to the twenty-sixth parallel of south latitude, and soon after another German gun-boat took possession of the whole of the rest of the West Coast, Walwich Bay and certain Islands excepted, in the name of the German Emperor. The British Government acquiesced in the action of the German Government; and this settled the question. The Cape Government, however, lost no time in legalising the annexation to the Colony of Walwich Bay, which was done by proclamation of Sir Hercules Robinson under Act 35 of 1884, and at the same time the annexation of the Port of St. John's, at the mouth of the Umzimvubu River on the East Coast, which had been proclaimed British territory in 1878, was completed.

The Government then carried through the incorporation of the whole of the Transkeian Territories. The districts of Griqualand East, Idutywa and Fingoland had been annexed by Act in 1877; and in 1885 the territories of Tembuland, Emigrant Tembuland, Gcalekaland and Bomvanaland, were made integral portions of the Cape of Good Hope.

The present inland boundaries of the Cape Colony are:—On the Eastern coast, the Umtata River from its mouth to the town of Umtata, and from thence along the line of road separating Griqualand East from Pondoland, to a point on the Umtamvuna River touching the boundary of Natal, thence to the Umzimkulu River, and north to the Drakensberg range of mountains, following them to the sources of the Telle River, and thence its junction with the Orange River, and along the course of the Orange River to a point named Ramah; then in a northern direction, along the boundary of the Orange Free State to Platberg, on the Vaal River; then following down the Vaal River to its junction with the Orange River, and thence to the mouth of that river on the Western Coast.

The total area of the Colony thus described embraces an extent of 213,636 square miles, being nearly double the area of the whole of Great Britain and Ireland.

The present population is computed at a total of 1,252,347 persons.

PHYSICAL ASPECTS OF THE COLONY.

The leading features of the physical geography of the Cape Colony, which greatly determine its climate and natural productions, are the several ranges of mountains that cross the country in irregular lines, and, separated from each other by valleys and plains, form a series of terraces rising in successively-increasing altitudes, from the seaboard to the interior.

The Cape Peninsula, which is generally the first land sighted by the voyager from England, presents a characteristic specimen of the form and structure of these mountain ranges, its tabular summit and peaks shooting up abruptly from the sea, and standing out bold and high. Table Mountain rises almost perpendicularly to a height of 3,852 feet above Table Bay. It is flanked on the right by the remarkable Lion's Head 2,100 feet high, the slopes on its neck covered by the beautiful satin-leafed Silver Tree, and its long round-backed extremity stretching outward as the Lion's Rump. On the left again there is the picturesque Devil's Peak (or Wind Berg of the old Dutch mariners) 3,315 feet in height; while in the horse-shoe valley between these points, the city of Cape Town is spread out, with its suburbs extending around the mountains for fourteen miles, from Sea Point to Constantia.

A heath-covered sandy tract, forming the isthmus between Table Bay and False Bay, connects the Cape Peninsula with the Drakenstein and Hottentots Holland mountain range, which is the first high barrier between the coast region and the inland districts. These mountains stretch southward to Cape Hanglip at the entrance of False Bay, and northwards in a somewhat irregular series through Clanwilliam and Namaqualand to the Orange River. The vine-growing valleys of Stellenbosch, Drakenstein, Paarl, Wellington, Twenty-four Rivers and the Olifant's River are along the seaward slopes and spurs of these mountains, while the undulating plains reaching from them to the coast are extensive grain-producing districts, known as the "granary" of the Colony. The Berg River runs through a portion of this country, from Fransche Hoek to St. Helena Bay, over a course of 63 miles.

Immediately behind the first range, is another having its highest point in the Winterhoek 6,840 feet near Tulbagh. This forms the principal watershed of the west; the drainage on one side running to the Olifant's River, which empties itself into the Atlantic, and on the other to the Breede River, which flows into the Indian Ocean. The Breede River is navigable for small vessels for some distance from it mouth. The fertile valleys of the

Warm Bokkeveld, Worcester, Goudini, Hex River, Robertson, and Montagu, are in this tract.

Proceeding eastward, the range is known as the Hex River, Langebergen, Outeniqua and Tzitzikamma mountains, running parallel to the coast, and subsiding near Cape St. Francis. This part of the country has been occupied for several generations by the descendants of the early colonists. There are many towns and villages established in it, such as Caledon, Swellendam, Heidelberg, Riversdale, George, and Mossel Bay, and the lands are occupied as corn farms, vineyards, orchards, tobacco plantations, sheep and cattle pastures, and ostrich enclosures. From George and the Knysna to the Tzitzikamma, near Humansdorp, it is well wooded, the forests running for a distance of 170 miles with a varying depth of from ten to twenty miles from the sea.

A third range, known as the Zwarteberg, diverges from the elevated Hex River Heights, and encloses on one side the Ghannaland Karoo, Tradouw and the fertile districts of Ladismith, Oudtshoorn, and Lange Kloof, while on the other it forms the boundary of the "Great Karoo." The same range extends eastward as the Antoniesberg, Elandsberg, and the Cockscomb or Great Winterhoek, rising to 5,967 feet in the Uitenhage division, and there joining the hilly ridges of the Zuurberg, which die away some distance beyond Graham's Town, near the mouth of the Great Fish River.

The Great "Karoo"—signifying a dry or arid country—consists of extended undulating plains, dotted over with small bushes, and is characterised by a general absence of shade, of verdure, and of permanent surface waters. Behind this Great Karoo there rises a bold escarpment of flat-topped hills, known on the western side as the Roggeveld and Nieuwveld mountains, and further eastward as the Sneeuwbergen. These form the higher plateau of the Upper Karoo districts, sloping away to the valley of the Orange River. Here the wide-spreading bushy plains are more or less diversified by hills of sandstone and shale, and conical dykes or kopjes of black trap rock. The hills of the Roggeveld reach to 5,150 feet; but the highest point of the Sneeuwbergen (the Compassberg or Spitzkop mountain, in the Richmond district) rises to 7,800 feet above sea level. This constitutes the central watershed of the Colony; the drainage on one side running north to the Orange River, and on the other flowing south-eastward to the Indian Ocean.

The plains of the Karoo bear no resemblance to the sandy wastes of Sahara. In seasons of drought, the soil is parched and arid, and vegetation scorched and shrivelled; but after rains it is transformed into luxuriant pastures, carrying countless flocks of sheep, and herds of cattle and horses, which thrive wonderfully on the

aromatic herbage, and peculiar dryness and salubrity of its climate. In former years, these plains abounded with wild game; and even as late as 1844, the notable Nimrod, Roualeyn Gordon Cumming, of Altyre (whose spoils of the chase from South Africa attracted so much notice in London during the first Great Exhibition of 1851), had his hunting grounds in the neighbourhood of the Thebus Mountain, on the borders of the Middelburg and Cradock districts. Thousands of springboks, interspersed with troops of gnus, or wildebeeste, quaggas, zebras, ostriches and other game, then dotted the immense flats, which are now occupied with flocks of wool-bearing sheep, farmers' dwellings, orchards and gardens. Of the larger game, there are few at present to be found within the boundaries of the Colony; but springboks are generally to be seen quietly grazing or scouring over the plain, and a small troop of zebras still occupy the mountain pastures within five miles of Cradock. In other portions of the Colony, the stately Koodo and the beautiful bontebok are preserved on private properties; and in the Knysna forests and Addo Bush, elephants and buffalo are more numerous than in the Transvaal.

From the central range of the Sneeuwbergen, an arm runs eastward under the names of Tandtjesberg, Zwagershoek, and Boschberg, linking on to the Great Winterberg Mountain, over 7,000 feet high, then extending along the grassy heights of the Katberg, Elandsberg, Gaikaskop, the Hogsback and the Amatolas, and terminating with the Buffalo and Kologha ranges, in the division of King William's Town.

This grassy plateau stretches further northward to the boundary of the Queen's Town district, rising from there by another step to the Stormberg Mountains, 6,000 to 7,000 feet in height, where are situate the border districts of Wodehouse, Aliwal North and Barkly; and then it joins on to the Drakensberg or Quathlamba Mountains, whose highest peak, 10,000 feet, is on the borders of the adjacent Colony of Natal.

The structure of these various mountain ranges and the Geology of the Colony generally, has now been pretty accurately determined; although there are still many important points and details to be worked out by accurate survey. The three classes of formations, primary, secondary and tertiary, have each their representatives in South Africa, and are to be met with under circumstances analagous to those in which they are found on other parts of the earth's crust.

The mountains nearest the seaboard, and the rocks forming the littoral of the south and eastern parts of the Colony, consist of the Palæozoic or primary formation, pierced and penetrated by intrusive rocks. Clay-slate, sometimes broken through and altered by granite, is the underlying formation over the whole of the southern

districts; while on the west coast, from the Oliphants River northwards and extending into Bushmanland, the prevailing formation is granite and gneiss, passing into metamorphic schists as the Orange River is approached. It is in this tract that the valuable Namaqualand copper mines are situate.

Metamorphic rocks similar to the Namaqualand schists also appear on the east side of the colony, at George and Knysna, associated with gneiss, and penetrated by granite veins, and veins and reef of quartz; traces of gold have been found here over a considerable area, but not sufficient to encourage working.

Above the clay-slate, is a great sedimentary deposit of quartzose sandstone, with in some places imbedded pebbles, such as forms the upper portion of the Table Mountain, Lion's Head, and also the Hottentots Holland and Langebergen ranges. Both the clay-slate and this sandstone have as yet proved unfossiliferous.

Resting conformably on the sandstone, in the second range of mountains, are a series of argillaceous shales and coarse red sandstones, which contain numerous fossils, chiefly trilobites, brachiopods, and encrinites, characteristic of the Upper Silurian or Devonian rocks. These fossiliferous deposits extend along the mountains northward from the Gydow, behind Ceres, to the Cedarbergen, and eastward along the Hex River heights and the Great Zwarteberg towards Uitenhage.

At the base of the Zwarteberg range, which is considered to be of the Devonian or Old Red Sandstone period, there is a limestone which belongs to the Namaqualand schists formation. In this limestone occurs the famed Cango caves, a series of very curious and interesting stalactite caverns or grottoes, which were visited in 1874 by Sir H. Barkly, accompanied by 300 of the neighbouring residents. Although persons have penetrated these caves for more than a mile distance, they have never been explored to the end; and their inner recesses still remain as a field of adventure for any one ambitious of going where man has never been before. The caves have been thus described by Lieut. Shirwell, an Indian visitor, who declared that Elephanta, and other caves of India, did not gratify him so much as these:—

"At the mouth of the caves, a stout ladder was lowered down, and we descended to the depth of about 33 or 34 feet, and found ourselves standing in a vast hall of six hundred feet in length, about one hundred in breadth, and from sixty to seventy feet high. In the centre of this magnificent cave stands a colossal stalactite of seventy feet in height, white as the purest marble, and sparkling as if strewn with diamonds.

"From the roof depend enormous masses of lime, gradually growing into stalactital columns, whilst on the damp ground rising to meet these pendant masses, are huge stalagmites formed by the continual filtration of lime through the superincumbent rocks; some have

nearly met and formed columns, others are but commencing to form; in fact the whole floor of the cave is strewed with stalagmites of various growths, and on the roof, opposite to each, hangs a corresponding mass.

"The work of filtration of calcareous matter is proceeding steadily, and in time this vast hall will become a labyrinth of pure alabaster-like columns. This cave is known by the name of Van Zyl's Flak, after the discoverer, a Dutch Boer, who discovered the caverns whilst hunting in these mountains.

"Leaving this hall, we entered a small cavern about forty feet square, and thirty feet high. This is called the Registry, from a practice of visitors writing their names on the pure snow white lime walls. A few more paces brought us to the most beautiful and most wonderful part of the caverns. Whilst writing our names in the registry, all the boers except one, who had delayed us purposely by pointing out various names and superscriptions, had quietly slipped away, but on passing from this spot through a narrow passage and entering the next cave, we soon perceived why they had left us. A sight at once beautiful and astonishing now burst upon our sight. We stood in a vast cave, one hundred and forty feet square, and about fifty in height, the whole of the most dazzling and sparkling whiteness; columns and pillars snow white, and some transparent crystallized lime stood on all sides, the roof covered with innumerable small and delicate icicle looking stalectites, each with a huge drop of pure water hanging from their extremities, and as each drop parted company with its filter and fell to the ground, it had the appearance as if a shower of diamonds was falling from the roof. The boers had all taken up positions with their lights to enable us to see the whole of this fairy-like cavern at one *coup d'oeil*. I stood bewildered and astonished at this wonderful sight. In the centre of the cavern stands a column as pure and as white as alabaster. It is the height of the hall, fifty feet, and about nine feet in circumference, and worked in the most minute manner. It is of pure crystallized lime, surrounded by horizontal bands or raised divisions at every three or four feet. These divisions are filled up with minute filigree work and vertical lines, in fact the column appears, to use a borrowed simile, as if "raised by a giant, and finished by a jeweller." At either end of the hall are groups of the same substance, resembling bed curtains and flowery drapery, running into elegant arabesques. All around the sides of the hall the lime has taken the forms of various objects, amongst which fancy may discover a high altar of a Catholic church, decked out with all the paraphernalia of grand mass; stalactites, resembling high and lofty candelabra, cups and goblets, steps and censors; in another corner may be seen a collection of elegant drapery, flowers, trees and animals; one mass in particular bears the exact resemblance to the head of a gigantic bull.

"Being continually saturated with water, the groups appear semi-transparent, the hanging and falling drops of water also reflect the light of the torches, giving to the whole a dazzling and sparkling appearance. The spar when broken off, dries and loses its trans-

parency becoming a dull and opaque body. Leading out of this hall are innumerable passages: where they lead to, or how far they extend no one knows. The walls are pierced in every direction with dark looking openings, each leading into other caverns, thus making the whole mountain one vast network of caves and grottoes. As a specimen of natural excavation, I much doubt if these caverns are to be equalled by any in the world, both for beauty, height, or extent, for their extent is as yet quite unknown."

The northern slopes of the Zwartberg range consist of sandstones and quartzite of the same age as the Zuurberg mountain (Carboniferous). Succeeding these is a conglomerate formation whose peculiar characteristic is the number of pebbles and fragments of other rocks, from the size of a pea to several tons in weight, imbedded in it. Various observers have termed this a claystone porphyry, a trap ash, a metamorphic conglomerate, and a boulder clay. Its origin has been attributed to igneous action, to glacial action, and to aqueous distribution. But observations which have just been concluded by Mr. E. J. Dunn, in his recent geological surveys on behalf of the Government, establish the fact that this conglomerate is of glacial origin. Not only are the boulders, blocks, and pebbles striated, scored, and grooved, but they have also flat surfaces ground on them, in some cases. Its outcrop has now been traced from the Vaal River, near Kimberley, through Bushmanland south of the Orange River, down past Calvinia to Karoo Poort, and thence easterly, past Prince Albert and Graham's Town, to the Gulana River mouth. It re-enters the land south of the mouth of St. John's River, crosses the Umzimkulu Drift, entering Natal, and continues past Pietermaritzburg on to the junction of the Tugela and Buffalo Rivers and into Zululand. The whole of the area included by the outcrop is underlaid by this remarkable conglomerate, which extends over a length of 700 miles, with a breadth of about 250 miles. At one point, about a mile from the junction of the Vaal and Orange Rivers, a distinctly glaciated rock surface is laid bare, with the conglomerate, containing striated pebbles and boulders, resting upon it.

Overlying this conglomerate are carbonaceous shales, forming the Lower Karoo Beds. These beds dip away from the conglomerate on the north side towards the south, and on the south towards the north, forming apparently an immense trough or basin, in which there now appears a probability of coal deposits being found in positions more central and accessible, and of greater value to the country than any hitherto discovered. It is in these carbonaceous shales that the diamond mines are situate at Kimberley.

Above the Lower Karoo Beds are the Upper Karoo Beds. These formations together, forming the Karoo plains, cover an immense area, extending from the boundary of the gneiss, in the Calvinia

district on the west, to the Zwarteberg and Zuurberg on the east, spreading over the Midland and most of the Eastern Districts, and stretching northwards as far as the Vaal River.

In these Karoo beds, a great variety of fossil reptilian vertebrates (Dicynodonts, &c.) are found. They have been described and catalogued by Sir Richard Owen, the eminent palaeontologist, who, writing of them, says:—"Before the continent of Africa as it now is existed, these animals lived, died, and propagated their kinds through untold generations. From their jaws and dentition they were herbivorous, and from what is known of their limbs more terrestrial than aquatic. The old lake-basins represented by these deposits much exceed in extent those inland fresh water seas which recent explorers have now discovered for us in the centre of the Continent." As to the age of these Saurians, Sir R. Owen adds, the present phase of evidence is that they are not later in time than the Trias, and probably lived in the Palæozoic periods.

The Stormberg Coal Measures, from their characteristic plants and fossils, are considered to be of the secondary or Mesozoic epoch. They measure about 1,000 feet thick and rest immediately and conformably on the Upper Karoo beds, the principal deposits as yet found, and now in course of working, being at from 300 to 400 feet from the base. Mr. Dunn classes these Stormberg rocks in four groups, rising in succession, viz.:—Coal Measures, Red Beds, Cave Sandstone, and Volcanic rocks. Very grand scenery results from the weathering of these sandstones, and caves of large size occur in them.

Representing later geological periods, are the Sunday's River Beds (Jurassic), extending along the course of the Sunday's River, the valley of the Olifant's River, in Oudtshoorn, and from Mossel Bay to Heidelberg; and the Tertiary clays, limestones, and sandstones found in the Zwartkops River Valley, on the old race-course at Graham's Town, and on the Cape Flats, and elsewhere.

Unmistakeable old volcanoes, which were probably the centre of eruptive activity in the Triassic age, are found in the Stormberg range. Two of them still preserve a crater-like shape—one is locally known as Glatkopjes, and the other as Telemachus Kop.

In the middle and eastern portions of the Colony, igneous rocks occur abundantly, shewing that after the deposit of the Karoo beds and at the close of the period occupied in the accumulation of the Stormberg beds, volcanic agencies on a grand scale were developed, and vast masses of dolerite introduced through the stratified rocks in all directions; but although passing through, they did not generally disturb their horizontal position. The contours of most of the hills and mountains are thus always marked by bold and massive outlines.

To some English readers, it may come as a surprise that South African scenery, instead of being dreary and monotonous, has a fair proportion of grand and majestic as well as wondrously beautiful and picturesque points. The bold, towering mountains of the Eastern districts, of the Stormberg, and the Drakensberg, compare favourably with anything in Wales, the West of Ireland, or the Highlands of Scotland. The combination of hill and lake and woodland in the divisions of George and Knysna, and along the reaches of the St. John's River, bear contrast in some respects with Cumberland and Westmoreland. The jungly ravines and the dense primeval forests, where "Nature reigns supreme in awful loneliness," have a rare wild beauty of their own; in their deep recesses, beneath the shade of majestic yellowwoods, you may wander for hours, so far as the tangled undergrowth will let you, the silence unbroken save by the wind among the trees, the subdued note of a bird, or the chirp of an insect. There is also a great charm in the pure translucent atmosphere of the country; in its strange yet exquisite vegetation, and in the brilliant colouring of mountain slope or forest glade under the purple light of morning, or the rosy glow of sunset—

> When the sultry summer noon is past,
> And mellow evening comes at last,
> With a low and languid breeze
> Fanning the Mimosa trees.

Even the wide-extending pastoral plains of the Karoo have a certain attraction for many—not merely as valuable sheep-walks, or for the herds of wild game occasionally met with, but from the freedom as well as the exhilarating buoyant air of the desert, and that strange sense of solitude which is realised as one gazes over the unbroken perspective of blue sky and fading distance,

> When no tree, nor cloud, nor misty mount,
> Appear to refresh the aching eye;
> But the barren earth and the burning sky,
> And the blank horizon round and round,
> Spread—void of living sight and sound.

The traveller who journeys up country, in crossing several of the mountain ranges, may enjoy a diversity of panorama scarcely inferior to that which is obtained along the great Alpine passes. The Hottentot's Holland Kloof, on the main route from Cape Town to the frontier, is one of these elevations, rising a sheer height of near a thousand feet, and overlooking the whole of the Cape Peninsula from False Bay to Table Bay. Still more attractive, as well as imposing, is the entrance to the interior by Bain's Kloof, Mitchell's Pass, and Karoo Poort. The railway carries you from Cape Town to the pretty village of Wellington, at the foot of the mountain range, where the road winds up with many a

REACH OF THE ST. JOHN'S RIVER

curve and stretch for seven or eight miles to the crown of Bain's Pass, commanding a magnificent panorama of the surrounding country. Here the prospect extends over a distance of forty or fifty miles, yet the atmosphere generally is so clear and transparent that every feature stands revealed with the most minute distinctness. The silvery stream of the Berg River, the tree-embowered township of the Paarl, stretching at the base of the immense glistening domes of granite rock which the old colonists named the Pearl and Diamond; the village of Wellington, with its white-washed houses and brown orchards; and the succession of trim homesteads, vineyards, and corn-fields, spreading out mile after mile, to the white line of surf which marks the deep blue sea north of Table Bay, are all as plain to the eye as the smooth velvet slopes of the Groeneberg, and the dark green and gold of the orange groves surrounding the farms snugly nestled in the Wagonmaker's Valley many hundreds of feet immediately below.

The scene is one of pleasing landscape beauty, such as no other part of the Colony affords; and it contrasts most strikingly with the wild grandeur of the eastern side of the Kloof, a few yards further on. Huge mountain masses there form the portal of the Titanic gorge, through which the Pass gradually descends for about ten miles to the Breede River Valley. Nearly all along this way the road has been blasted and scarped out of a hard quartzose sandstone—in some places being cut through frowning krantzes, leaving gigantic gates, natural arches, and overhanging ledges; in others crossing abyss-like gaps and fissures, which have been built up with precipitous retaining and parapet walls from 100 to 300 feet high. "Hills upon hills in quick succession rise" as you advance, and new objects of admiration or astonishment are ever presenting themselves. The rock scenery is singularly weird and fantastic—now rising high in majestic buttressed walls, then piled up in craggy pinnacles—here standing in gaunt spectral groups, or there strewn in broken and crumbled confusion. Its scathed and weather-worn character in many places might convey a dreary and perhaps monotonous impression, if it were not for the endless charms of light and shade arising from the winding course of the road, and the varied colours and forms of the vegetation which fringes the sides of the mountains. Although not so luxuriant nor so dense as in other places, there is generally a rich display of characteristic Cape flora. Heaths of scarlet, purple, and other hues; bulbs of great variety; orchids, ferns, and several handsome shrubs and dwarf trees, alternate together with grasses, creepers, and soft mosses; and the stratified formation of the sandstone encloses many humid recesses whence issue rills and streams which keep these evergreen and fresh all the year round. The flowering season of September, however, is the time to see the Pass to ad-

vantage; then after the winter rains, there are countless sprays, cascades, and waterfalls, leaping from ledge and precipice, and rushing down to swell the dark tarn-like pools and roaring torrent of the Witte River at the bottom of the deep ravine.

Emerging from the Kloof at Darling Bridge, the flats forming the Tulbagh and Worcester valley are traversed, and then the Michell's Pass in Mostert's Hoek greets you. This is another mountain scene of great boldness and picturesque beauty. The Breede River, a clear wide stream, is bridged across at the entrance, and the road ascends along the left bank for a length of about six miles, the whole of it being scarped out of the rock, and strengthened by a retaining wall, from three to forty feet in height. The old road—little more than a cattle track—is still to be seen climbing over projecting krantzes, and then descending abruptly to the river bed, and farmers delight to tell of their perilous adventures in crossing it, not many years ago, when waggons and produce had to be carried over piecemeal, or on the backs of oxen, and afterwards put together and re-arranged, when they had managed to scramble through. In this kloof the mountains appear more huddled together, and tower up in grand and wild confusion, the cliffs, and peaks, and crags seeming to topple every way from the highly inclined stratification of the rocks, while the many grassy hollows and patches of flowering heaths and shrubs clothing their sides give a soft verdant character to the scene. On reaching its summit, which is about 2,000 feet above the sea, the village of Ceres and the District of Warm Bokkeveld are seen stretched out on a circular undulating plain bounded by the heights of the Cold Bokkeveld, which are all snow-clad in winter. From here one road passes over these heights by the Gydow Mountain to the northern parts of the Bokkeveld, and another proceeds by the steep and toilsome ascent of the Hottentot's Kloof to the Karoo Poort, leading to Calvinia and Roggeveld, and Beaufort West and the Interior.

From Port Elizabeth, a few hours journey by rail brings you to the Zuurberg Mountain Pass, which is unrivalled in point of beauty of vegetation and novelty of scene. Stopping at the Coerney Station, the approach to the Pass is for some distance through portion of the Addo Bush—a dense jungle consisting chiefly of spekboom and other succulent plants, growing in such rank luxuriance as to be almost impervious unless a path be cut through them. Many parts of the frontier are covered with such thickets, which in the time of war were occupied by the Kafirs as natural strongholds, whence they could suprise their objects of attack or elude their pursuers. At this place the Bush gives shelter to a few herds of elephants, whose foot-prints and tracks are occasionally to be seen crossing the road; and the old Dutch

colonist who is owner of a farm about half-way to the mountain is sometimes subjected to nocturnal visits from them. "The flies and the elephants," he says, are the only troubles of his life; the former swarm and tease him during the day, whilst the latter trample the corn-fields at night, and are "too big to wrestle with." Their numbers, however, are now fast diminishing, and apparently they are getting more timid and suspicious of man, as they have removed their haunts to the extreme recesses of the "bush."

Nearing the foot of the Pass, the mountain heights in the foreground, clothed with the strange, stiff, gaunt forms of the gigantic Euphorbia, have rather a gloomy, sombre effect; but this is soon lightened and improved as the view changes when the first ascent of a quarter of a mile is made, and the grandeur and beauty of the hill and forest scenery is disclosed. Then there are imposing bushy cliffs and weather-stained rocks bristling against the sky overhead, while in the valley outstretched below lofty trees, draped with grey lichens, or festooned with convolvolus, wild vine, or monkey rope parasites stand up like ancient monarchs, as they are, out of the tangled mass of copse, clustering shrubs, flowering plants, grasses, and ferns, which form the undergrowth vegetation. Through this the road rises, cut out of the solid rock on one side, with deep perpendicular precipices on the other, until it passes through a rocky gateway, and emerges at the top, on what is apparently a table-land of grassy downs, but in reality is one of the several hilly ridges, running off into deep furrows and kloofs in every direction. It is in crossing these "necks" or ridges that the peculiar character of the Zuurberg is realised and seen to advantage. The poet Pringle was strikingly impressed with it, as far surpassing anything of the kind he had witnessed elsewhere, or formed a conception of from the accounts of others. He describes it as "a billowy chaos of naked mountains, rocks, precipices, and yawning abysses, that looked as if hurled together by some prodigious convulsion of nature, while over the lower declivities and deep sunk dells a dark impenetrable forest spreads its shaggy skirts, and adds to the whole a still more wild and savage sublimity." It is indeed a superb scene when looked upon from the summit of the mountain which commands a bird's-eye view of all the lower ranges. There you can mark the great arches and deep troughs of the Zuurberg formation, now rising in soft rounded contours, then swelling out in gentle undulations, the emerald grassy slopes contrasting with the grey precipices and dark foliage of the forest recesses, or the bright silvery gleams of the streams in the intervening deep valleys. There is also a splendid prospect of the surrounding country stretching to the coast and the waters of the Indian Ocean, as well as of the fantastic peaks of the Winterhoek

mountain (the Cockscomb), which in the clear atmosphere appears much nearer than it actually is.

The heights above the city of Graham's Town also command a magnificent view of characteristic frontier scenery—an exquisite landscape of tumbled hills and dales, variegated with verdant slopes and wooded heights, and backed by massive mountains, whose tops fade into the blue haze on the far distant horizon. Woest Hill on the one side and Botha's Hill on the other, each afford a good prospect, but the culminating point of view is Governor's Kop, an eminence about 2,700 feet high, ten miles east of the city. Directly in front and north-eastward, the gloomy dark valleys of the Great Fish River extend; one can discern the tower of Fort Peddie, and the sand hills between the Fish River and the Beka, and in the distance the mountains of Kaffraria, with the peak of Tabindoda or the Man Mountain. To the right there appear spread out

> The gardens of Albany with their evergreen parks and rich corn land,
> Their soft grassy slopes, wooded kloofs and deep vleis, with the broad-leaved lotus
> Wafting delicious perfume around;

while in the distance the white farm-houses of Bathurst and the Kowie are scattered in groups, and the coast line is girded with a beautiful sapphire belt, formed by the Indian Ocean, extending as far as the eye can reach, from the Bushman's River to the Keiskamma.

On the great northern road, leading from Graham's Town to Queen's Town, there is another mountain pass, the Katberg, of striking grandeur and romantic beauty, and the approach to it through Fort Beaufort and the Kat River district is fittingly picturesque. The mountain, at the point where the road crosses it, cannot be less than 3,000 or 4,000 feet high, and the pass winds up on the ridge of a kloof, through bush and forest and rocky krantzes and over waterfalls and fearfully deep gullies, which make one marvel at the intrepidity and skill of the engineer who laid it out. On the breast of the Katberg there are three distinct belts or zones, the lower consisting of undulating slopes and coombs, some of them of richest emerald green: others, hardly less beautiful, of a ripe russet-yellow tint, which harmonize delightfully with the dark sombre forest foliage in the zone immediately above. This forest covers not merely the ravines, but the whole breadth of the mountain within the limits of elevation to which it extends; and at some points in the Pass nothing can be more striking than to gaze upwards to the forest-clothed heights above you, and then glance down into the yawning depths of still grander forest in the ravines and gullies almost perpendicularly beneath. Above all this again, you have the third zone of magnificently precipitous rock, rising in columnar basalt, and forming a perfect diadem along

the mountain crest. From the top a magnificent outlook over the valleys far below is to be had, and according to the season of the year or the state of the weather, it changes from the picturesque to the wild and fantastical. We visited it on a bright clear summer's day, but it may be seen under different circumstances, such as in winter, when snow enwraps the heights in its white wreaths, giving it a perfectly Alpine appearance ; or in dark storm, when loud thunders echo over the rock peaks, and vivid lightnings illumine the yawning precipices around ; and at other times, when the spreading vales below are covered with a sea of silvery mist, out of which the tops of the hills rise up like islands on an expanse of ocean.

The whole of what once was Kafirland, but now is more commonly known as Kaffraria and the Transkeian Territories, is a glorious country, fertile and beautiful, and frequently grandly picturesque. The Drakensberg Mountains, which are more or less snow-clad during the winter months, present many magnificent scenes. Their native name "Quathlamba"—heaped up in a jagged manner—is descriptive of their general appearance. They assume the most fantastic shapes and forms, and it requires but a small stretch of the imagination to see depicted, castles and castellated turrets, spires, and pinnacles, in their rugged heights. Streams without number have their sources in them, and flow onward to the lower plateau, half-way to the sea-coast, where they are joined by many others, and their strength and volume increased until they unite and form the larger rivers, such as the Bashee, Umtata, and Umzimvubu. This tract consists of undulating plains and open valleys, abounding in rich grassy pasturage and very fertile soil. Dotted here and there over the surface of the country are the numberless huts and kraals of the native inhabitants, with their sleek cattle grazing on the grassy slopes—a picture of real pastoral beauty. Belts of hills and kops rise here and there along the valleys, their sides or crests covered with the dark rich foliage of Kafir forest trees and bush, while glinting out from between their cover may be seen streamlets falling from considerable heights in magnificent cascades.

In this land waterfalls are numerous, as they may also be said to be along a good portion of the eastern mountain slopes of the Colony. One of the largest and most magnificent is on the Tsitza River, near to Shawbury Mission station, along the main road from Umtata to Kokstad. Below Shawbury the river takes a bend, and after running through some picturesque gorges wooded to the water's ridge, it passes across a flat country until it reaches the edge of a huge precipice, over which it rushes. This rift or chasm is some 150 yards across, and the volumes of seething water make a gigantic leap into the abyss. In heavy floods this is a

grand sight to witness—the whole forming one continuous broad sheet, and each foaming wave seeming to endeavour to overtake its predecessor before reaching the depths below. The falls have been measured, and reach the height of 375 feet, they therefore take pre-eminence as the highest in the Colony.

The grandest and most romantic scenery, however, is met with at the St. John's River, which may be reached by road from Umtata through Western Pondoland, or by vessel or steamer along the coast. From seaward, the river mouth is a noticeable object, and so remarkable that any one having once seen it, or even a sketch of it, cannot fail to recognise it again. A lofty table-topped mountain appears to have been cleft to its base, leaving a wedge-shaped gap through which the river flows to the sea. The edges of the cleft which, near the mouth, lie about 2,000 feet asunder, approach each other, until near the top of the first reach they are about 1,500 feet apart. They rise in abrupt forest-clad steeps until they attain a height of six to seven hundred feet. From these edges, on both sides of the river, plateaus extend until, on each side, other precipituous cliffs rise, which culminate about a mile and a half from the sea, where they attain a height of about 1,200 feet, and lie only 4,000 feet apart, considerably less than a mile. These are the well-known "Gates" of St. John's, or the Umzimvubu River.

"Like giant sentinels on either hand,
The stately portals of the river stand,
Their rugged crests, and headlands bold and free,
Rising in silent grandeur o'er the sea,
Whose foaming waves engird with silvery showers
St. John's grand cliffs and castellated towers.
Low at their feet, in deep eternal shade,
The river flows past mountain, krantz, and glade,
Onward and onward from its distant source,
Till, midst this scene sublime, it ends its course."

Inside of the "Gates" the river partakes more of the character of a lake or lagoon than a stream. There is an expanse of sky-blue water nearly 500 yards wide, between stately mountains and luxuriantly wooded hills. The steep wooded slopes come down close to the edge of the water, and in many places the thick tangled forest overhangs the margin, forming beautiful arcades. To appreciate the nature of this river scenery, one must witness the indescribable beauties of the spot, and its surroundings—long silent vistas of forest, with the ripple of water sounding through them, tumbled masses of rock covered with mosses, ferns and flowering creepers of all sorts in most bewildering luxuriance twining in heavy clustering masses around majestic old trees, whose every bough and leaf find their reflection as in a mirror in the placid waters, until in some places it is difficult to tell where the reality

ends and the shadow begins. The exquisite semi-tropical vegetation, African in its type and almost Brazilian in its beauty; the charms of light and shade over the grand panorama of mountain, wood, and water; and the glimpses of hill and dale, forming the high lands in the extreme distance and seemingly merging into the cobalt sky, furnish a picture of virgin Nature untouched by Art rarely to be met with.

The mouth of this river, like most of the rivers on the coast, is obstructed by a bar of shifting sand, the channel contracting, expanding, and changing its condition according to the volume of water or floods in the river. It is reported to have been so flooded on one occasion as to have had a width of 900 feet with a depth of 30 feet nearly the whole of the distance across. After the shallows and intricacies of the mouth and first half mile have been passed, the depths and channel are favourable for navigation, but this is not uniformly maintained, for, as the river is ascended, shallow banks, and an average lesser depth, but with alternating deep holes, are met, so that it is necessary that a vessel of over seven feet draft should wait for the high-water tides. The river remains navigable for shallow-draft barges or canoe boats for a total distance of 10 to 12 miles from the sea, at which point the tidal wave and all possible navigation is abruptly stopped by a pebbly steep inclination, down which the river waters flow from their distant drainage area, the rolling uplands of Pondoland and Griqualand East.

The verdure of these Eastern coast lands is due to the supplies of moisture carried to them by the trade winds of the Indian Ocean. The vapour-laden clouds are arrested or caught by the high mountain barriers, upon whose summits and sides their refreshing and fertilizing showers descend. And this brings us to a brief notice of the climatic and meteorological conditions of the Colony. The seasons at the Cape it must be remembered come in reverse order to those in the northern hemisphere;—thus, the Cape summer is from December to February; Autumn from March to May; Winter from June to August, and Spring from September to November.

One circumstance which has an important influence on the climate of the Colony is the existence of two ocean currents on its coasts—the one, the tropical ocean current coming down from the Mozambique channel along the east coast and around Cape L'Agulhas; and the other the cold South Atlantic current on the West Coast. Table Bay and False Bay mark the differences of temperature of the two—the waters of the latter at times registering 15° higher than those of the former.

Another striking distinction is, that in Autumn and Winter, the equatorial or return winds from the North-west discharge their

moisture in copious rains over the Western districts as far as the boundary of the Karoo and the Gouritz River, while at the same seasons of the year the Midland and Eastern districts are usually dry. In Spring and Summer again, the south-easterly winds laden with moisture from the tropical current of the Indian Ocean precipitate their rains along the mountain-ranges of the Eastern districts and the high plateaux extending to the centre of the Colony, while at this season the Western districts are comparatively dry.

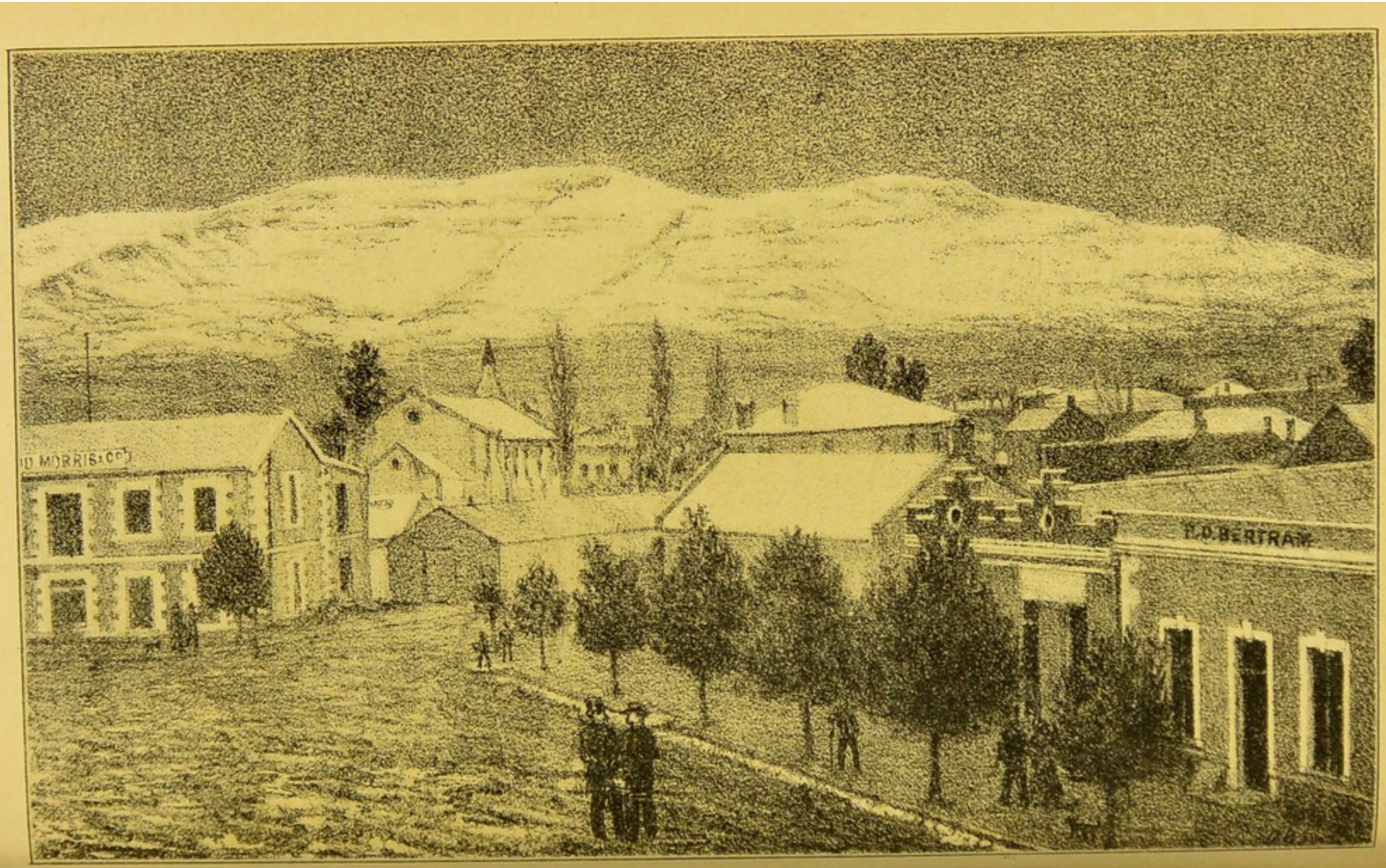
Thanks to the labours of the Government Meteorological Commission and of Mr. J. G. Gamble, Hydraulic Engineer, the distribution of rainfall in South Africa is beginning to be fairly understood, as will be seen from the Rainfall Map, which accompanies this Handbook, prefacing the chapter on the "Cape as a Health Resort." Rain-gauges are placed at every seat of magistracy in the Colony and the observations registered are regularly tabulated and published. From these several stations the monthly averages have been taken and diagrams prepared shewing the rainfall at various places during each season of the year. Mr. Gamble thus sums up the result of these observations:—

"The North-west of the Colony is almost rainless. The south-west has abundant winter rains. The south coast has rain in all months, December and January being the driest time; in the midlands, as well as in the north and east, the rains occur generally in February and March, though near the coast there is a second maximum in October and November.

"Droughts seldom occur all over the Colony in the same year; in fact it seems as if a drought in the interior frequently occurs in the same year as abundant rains on the south-west coast.

"The statement is frequently made that South Africa is drying up. If by this is meant that the springs and streams are not so constant as they used to be, the statement is undoubtedly true. If it is meant that less rain falls than in former historic times, the statement has certainly not been proved, and is most probably untrue. The early books of travels speak of droughts in the interior; Sparrman mentions the great drought of 1775. The forty-five years of rainfall measurement at the Royal Observatory give no support to the view that the quantity of rain is diminishing. But the cutting down of trees, and the burning of the veld has affected and is affecting the permanence of springs and streams. Both white men and natives seem to act recklessly in this matter, cutting down bush for kraals and firewood, the natives especially using large quantities of young trees for their huts and game traps. The increased number of flocks has also contributed to this result. Where the grasses and bushes are eaten off the sun bakes the soil, and the rain runs off into the rivers, forming new 'sluits' as it runs, and is lost in the sea without replenishing the underground supplies."

The rainfall is variable in amount, as will be seen from the following examples. At Pella, on the north-west border, the


H.D.BERTRAM

average yearly fall is 2¼ inches, one-fifth of which falls in May. For five years there has been no rains during November. At the Royal Observatory, near Cape Town, the average is about 25 inches, three-fifths of which falls during the winter months, May, June, and July. August is also one of the rainiest months. At Mossel Bay and Port Elizabeth, as well as at most coast towns the rainfall is irregularly distributed throughout the year. The yearly fall at the former town is 16 inches; at the latter 23 inches. At Mossel Bay the wettest months are February and March, at Port Elizabeth, May and October. January is the driest month at both places. At Carnarvon, a town in the Northern Karroo, and fairly typical of that district, the average rainfall is 8 inches, one-fifth of which falls in March; from June to December, the average for each month is less than half an inch. At Graaff-Reinet, in the east central Karroo, the average is 14½ inches, and the wettest month, March. Queen's Town and Aliwal North, towns on the Eastern border, have average yearly falls of 20¾ inches and 24½ inches respectively. Their greatest rains generally occur in February and March, and their droughts in June, July, and August,—in these respects resembling the towns in the Karroo.

In the course of the winter season, during some days, the peaks of the Drakenstein and Winterhoek mountains within sight of Cape Town are white with snow; and up-country the mountain ranges such as the Sneeuwbergen and Amatolas are frequently covered; while on the Drakensberg and about Barkly East snow lies for weeks together. The up-country winters are usually very dry, but at intervals of some years, snow sufficient to enable snow-balling to be indulged in, has fallen at Kimberley, Beaufort West and Queen's Town. The accompanying illustration is from a photograph by Mr. Dugmore of Queen's Town, giving a view from the Octagon-square of that place, shewing the surrounding hills enveloped in a snowy mantle.

With regard to the temperature of the air, the Cape, generally speaking, is not a hot country. During some days in the month of January the heat is excessive, but it never lasts for more than a short time. The greatest heat of summer is not more than in the hottest parts of Europe; and the prevailing winds and dry atmosphere temper such excesses, rendering the warmest day supportable, while the balmy coolness of the nights are surpassingly agreeable and enjoyable.

At the Royal Observatory, two miles from the coast, the mean temperature of the air throughout the year is about 61° 26′ Fahr. in the shade, the hottest days being in January, with an average temperature of 68° 92′, the coldest about July, with an average temperature of 54° 03′. Elsewhere, in the Colony, the observations have been rather intermittent and not

extended over so long a period, but they are sufficiently reliable to serve as an index to the climate. Mr. Gamble has observed that "places on the coast have a much less range both in the annual and daily period than those in the interior. The summers and the noondays are hotter up-country than by the sea; and the winters and the early mornings before dawn are milder by the ocean than inland." He gives the following table of temperature means reduced from a series of observations :—

	Height above sea. feet.	Winter.			Summer.		
		min. deg.	mean. deg.	max. deg.	min. deg.	mean. deg.	max. deg.
Royal Observatory	37	47	55	62	58	68	79
Wynberg	250	48	55	65	57	67	80
Simon's Town	? 100	52	58	65	64	70	80
Somerset West	? 100	46	55	64	59	74	84
Wellington	360	45	54	63	59	71	81
Worcester	794	43	56	65	58	75	86
Clanwilliam	300	38	57	66	56	80	91
Mossel Bay	105	51	57	64	63	69	77
Port Elizabeth	181	51	58	66	63	69	77
Nel's Poort	3,100	41	51	66	56	72	89
Graaff-Reinet	2,500	44	56	67	62	75	88
Somerset East	2,500	46	55	63	61	69	79
Graham's Town	1,800	45	57	65	60	69	79
K. William's Town	1,314	39	53	67	56	68	81
East London	30	50	58	68	62	65	76
Aliwal North	4,300	33	44	60	59	70	88

In some of the Eastern Districts hot winds are occasionally experienced during summer; they come from the north-west, carrying with them waves of heated air from the central plains, blowing as if from a furnace; but, fortunately, they are not of long duration. Hail-storms are rare in the West, but in the Midland, Northern, and Border districts they occur with such violence as to cause considerable damage to vegetation and stock. Thunder-storms are also very rare in the neighbourhood of Cape Town, but more inland they are frequent in summer, and often very grand—fleecy clouds rising on the horizon, and swelling and darkening until the lightning flashes along them and the thunder peals out with prolonged and increasing reverberation; it is then a sight to watch the brilliant colours and forms of the electric discharges and their varied track against the inky black sky, now forked, now straight, now zig-zagged, now in quivering rays and horizontal flashes, appearing and disappearing rapidly, in the twinkling of an eye. Such striking exhibitions of Nature's elements, however, do not last long; after them the rain ceases, clouds roll up and disperse, and a delicious cool atmosphere follows.

CITIES AND TOWNS OF THE COLONY.

The city of Cape Town is the metropolis of the Cape Colony. It is by far the most populous of the towns scattered throughout South Africa; and its position as the seat of Government, as the meeting place of the Legislature, and as an important commercial entrepot, together with its many natural attractions and advantages, have contributed to gather around it a comparatively wealthy and stationary community, whose social circles possess all the charms of old established and cultivated European society.

The number of inhabitants of the city and suburbs is about 60,000, of whom two-thirds may be said to be residents of the city proper within its municipal boundaries. This embraces both white and coloured races, with all their varieties of nationality and gradations of blood, from fairest Saxon to darkest Ethiopian.

The first glimpse of Cape Town from seaward does not impress a stranger with its dimensions. The massive wall of Table Mountain forming the back ground, and the Devil's Peak and Lion's Head enclosing it on either flank, dwarfs the valley where the city is laid out. The houses present a mass of flat-roofed dwellings, a few church towers and some factory or mill chimneys rising up amongst them, with alternate villas, gardens, and vineyards on the outskirts, joining on to the pine and silver-tree plantations which clothe the base of the mountain. But if anyone takes the trouble to visit the more elevated points of view, such as are afforded by the Garden suburbs, or the drive along the Kloof Road, a perfect bird's-eye picture of the town and circling bay may be had, in many respects comparing favourably with Naples or Rio de Janeiro.

The Dutch founders of Cape Town laid out its squares and streets with mathematical preciseness. The main thoroughfares run parallel to each other from the mountain to the sea, and are crossed at right angles by secondary streets of lesser width. The central and principal street is Adderley-street, or the "Heerengracht," as it was formerly termed. Here, on the left hand are the Railway Station buildings, the Commercial Exchange and Reading-room, the imposing Standard Bank buildings, and, higher up, the capacious Dutch Reformed Church, with its quaint old vane-topped Flemish spire; while on the right hand there stretches a line of merchants' stores, the Cape of Good Hope Bank, warehouses, offices and shops—many of them large buildings with decorated exteriors, plate-glass windows, and all the attractions of the modern style of

street architecture. St. George's-street, adjoining Adderley-street, is also a fine open handsome street, in which the Post Office, the City Club, the South African Bank, the Bank of Africa, the Union Bank, the *Cape Times* and other newspaper offices are situate, and St. George's Cathedral with its Grecian front and ornamented tower stands at its upper end. Westward of these central throughfares, in such streets as Loop, Burg and Bree-streets, the old-fashioned Dutch mansions of the early colonists may be seen. The houses, which are spacious and lofty, have invariably flat roofs, massive white-washed fronts, numerous windows with small panes, and a stoep or terrace rising from the street at the entrance, while behind them is frequently a small garden or court ornamented with a trelissed vine. Eastward again, the modern part of the town where the English immigrants have settled, is distinctly marked. Rows of semi-detached cottages or pretentious villa residences, with slate roofs and little gardens, are extending with the growth of population all over the Table Valley and on to the suburbs of Woodstock, Maitland, and Mowbray.

The Government Gardens, at the top of Adderley-street, serve the purposes of a public park. The central walk or Avenue extends for three quarters of a mile through rows of grand old oaks, affording a grateful shade and pleasant place of resort to the inhabitants. The new Parliament Houses and the Public Library and Museum are close to the entrance of this Avenue, and adjoining it is the Fine Arts Gallery in New-street, facing the Botanic Gardens. The Botanic Gardens, although not more than fourteen acres in extent, are laid out with grass plots, shrubberies, and handsome conservatories, and contain upwards of 8,000 varieties of trees and plants, embracing rare exotic productions as well as specimens of the indigenous Flora. An extensive collection of Cape plants, authenticated by Harvey, Sonder, and other authorities, is also available for reference in the Herbarium attached to the institution.

Government House, the official residence of Her Majesty's Representative in the Colony, is on the left side of the Gardens, with a public entrance from the top of Grave-street. It is a heavy irregular building, originally commenced by the Dutch Company's officials, more than a century and a half ago, and altered and modernized from time to time. The other public buildings, occupied by the various chief departments of the Civil Government, and the Courts of Law, form a massive flat-fronted quadrangle, stretching from the lower end of Grave-street to Adderley-street. There are accommodated the Treasury, Audit, Deeds' Registry, Survey, the Attorney-General's, the Judges', and other offices; and the Supreme Court of the Colony.

The handsomest public buildings in Cape Town, however, are

the Parliament Houses, which form a substantial pile of considerable architectural beauty between the Government Gardens Avenue and Grave-street. These were completed and opened for public use last year. The principal front of the building faces Grave-street, and measures 264 feet in length; it is divided, roughly speaking, into a central portico, leading into the grand vestibule, the two debating chambers, and side pavilions. The portico is of massive dimensions, and is approached by a commanding flight of granite steps, which runs round three sides of it. The pavilions are relieved by groups of pilasters with Corinthian capitals, and are surmounted by domes and ventilators. The whole of the ground floor up to the level of the main floor has been built of Paarl granite, which makes a most suitable base. The building above this is of red brick, relieved by pilasters and window dressing of Portland cement, the effect being very pleasing and gratifying to the eye. The interior accommodation, for the business of the two Houses of Parliament is most complete, and arranged with a careful view to comfort and convenience. Besides the Debating Chambers, which are sixty-seven feet in length by thirty-six feet in width (only ten feet in length and width less than the House of Commons), there is a lofty hall of stately appearance, with marble pillars and tessellated pavement, which forms the Central Lobby or grand vestibule. Adjoining this is the Parliamentary Library, a beautiful apartment, fifty-three feet by thirty-two, with galleries above each other reaching to the full height of the building. There are a number of Committee rooms and spacious offices for the President and Speaker and officers of the Legislature. Refreshment and luncheon rooms, as well as smoking and billiard rooms, complete the arrangements for the comfort of members. For the accommodation of the public, there are roomy galleries for strangers, ladies, distinguished visitors, and the press. The lighting is effected by gas as well as electricity; the House of Assembly being illuminated by a tasteful equipment of Edison's incandescent lamps placed in convolvolus-shaped glass cups, on pendant brass electroliers. The ground floor of the building is occupied by the premier department of the Government, that of the Colonial Secretary, and by fire-proof vaults in which the records of Parliament and the Archives of the Colony are deposited. The entire cost of the buildings and grounds, including the furniture (provided by Messrs. Gillow, of London), has been £220,000. The Architect was Mr. H. S. Greaves, of the Colonial Public Works Department; and the Contractors, Messrs. Bull & Sons, of Southampton.

Another striking and handsome building is the colonial headquarter's establishment of our principal banking institution—the Standard Bank of British South Africa. It is situated at the

corner of Adderley and Darling-streets. The tellers' room, both in dimensions and finish, would do credit to any of the offices of the rich banking corporations of England or Scotland. The height from floor to ceiling is fifty feet, and the area of space set apart for the bank's customers is about 1,500 square feet. The building, which is surmounted by a marble figure of Britannia, was designed by Mr. Freeman, architect, and built by Mr. Inglesby, contractor, at a cost of about £32,000.

The military head-quarters of the Commander of the Forces and his staff are in the Castle—a quaint specimen of the ancient citadel, of pentagonal form, with ravelins, glacis, ditches, gate, sallyport, and all the other paraphernalia of the old fortifications. It was designed and commenced as early as 1672, and the bell on the gate tower bears date 1697, but the greater part of the existing quarters within the Castle appear to have been built or re-built between 1780 and 1785. Some years ago it was offered for sale to the colonial authorities by the Imperial Government. It is of little use for defensive purposes, and the space occupied by it could be very profitably turned to account for the convenience and improvement of the city. Ample garrison accommodation for the troops is provided in the main barracks in Caledon-square, and in the healthy camp at Wynberg.

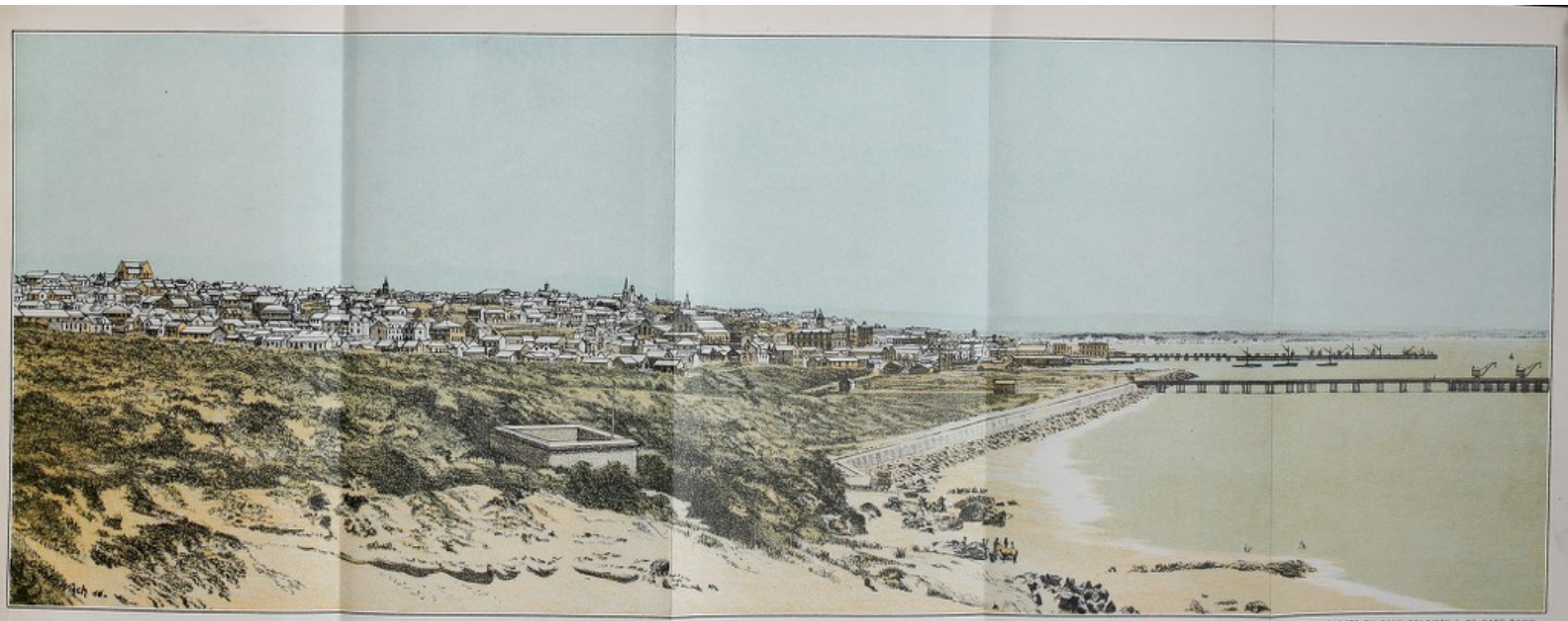
Another possession from the olden time is the Town House in Greenmarket-square, where the Mayor and Town Council carry on the municipal administration. It is a plain but substantial building, with cool, roomy halls and offices. The City has a regular water supply, is well lighted by gas, and a system of drainage and paving is being proceeded with which will improve its sanitary condition. The public traffic is carried on by omnibuses, tramcars, and cabs. There are spacious markets generally plentifully supplied with fish, vegetables, and fruit; and public sales of produce, wool, feathers, &c., take place weekly. A singular sight is the "Parade sales" held every Saturday, near the Military Parade-ground, where articles of the most miscellaneous character—lands, shares, cattle, horns and skins of wild game, equipages, furniture and "old clo's"—are put up to auction, attracting crowds of citizens of all classes, either as buyers or as loungers and lookers-on.

The surroundings of Cape Town are very pleasant. The marine suburbs of Green Point and Sea Point are connected with the city by a tramway, and at any hour of the day one may exchange the glowing heat and dusty streets for the pretty residences along the sea-shore, or the healthful breeze and magnificent ocean view of Botany or Camp's Bays. But the most populous and fashionable suburban resorts are Rondebosch, the Camp Ground, Newlands, Claremont, and Wynberg on the eastern side of Table Mountain. In such pleasant sylvan retreats nestled among the oak, poplar,

fir, and gum trees, the city merchants and officials delight to dwell, and there is a great deal to justify their choice; for during the summer months they are cooler, the difference of temperature at Wynberg being as much as ten degrees less than that of Cape Town, owing to its more elevated position and its exposure to the winds coming up from the south. And for those who wish further change of scene and air, there are the beaches of Muizenberg and the warm waters of Kalk Bay, now connected by rail with Cape Town. Any one travelling by the railway from the City will be charmed with the green lanes along the line from Mowbray and Rosebank to Claremont, the glimpses of shaggy wood and mountain precipices above Rondebosch and Newlands, and the open breezy flats stretching from Kenilworth across to the Stellenbosch hills. The drive along the main road in the same direction is even more delightful,—through the glorious avenue of pines and oaks extending onwards from Mowbray; past the Rondebosch village church and the woods of Westbrook; past the shady groves of Newlands and the slopes of Protea, the episcopal residence of the Bishop of Cape Town; up the Wynberg Hill, with its clumps and thickets of silver trees; and on to Cogill's, Rathfelder's, or the hospitable homesteads and rich vineyards of Constantia. Along this route, the alternate views of hill and dale, dotted with cottages, mansions, and verandahed retreats, with the grand background of mountains, are as charming as can be met with in any part of the Colony.

Port Elizabeth, situate on the shores of Algoa Bay, is one of the principal commercial towns of the Colony. Its population is about 18,000, of whom the greater portion are Europeans. The visitor arriving there by any of the mail steamers will find before him all the evidences of an enterprising, energetic, and prosperous place. For two or three miles along the water-side, and up the sloping hill ascending from it, and on the brow of the height above, there rise in succession warehouses, stores, manufactories, shops, offices, dwelling-houses, churches, schools, hospitals, villas, and other buildings of every description and variety of architecture. Close to the principal landing-place, in Jetty-street, is the Railway station, and along the sea-wall skirting the water's edge, the lines of rail are laid connecting Graham's Town, Uitenhage, and Graaff-Reinet as well as Colesberg and Kimberley with the port. Immediately above this is the central and business part of the town, forming what is known as the Main-street, containing the principal banking and mercantile establishments, shops, stores, and places of business, extending from Market-square through Queen's-street and Prince's-street to the Prison-buildings and the Park at the North-end.

Among the public buildings are the Town-hall; the capacious



PORT ELIZABETH AND ALGOA BAY IN 1886.

LITHOGRAPHED BY SAUL SOLOMON & Cº CAPE TOWN.

Produce-markets recently erected by the Town Council at a cost of £70,000, and covering an extensive area; the newly completed Government offices, the Post and Telegraph office, and the Hospital. The Town-hall in Market-square is a stately and commodious structure, somewhat in the Italian style, but with a portico of Corinthian columns. The Town Council offices are there, as well as the Chamber of Commerce, the public reading-room and library, and a small museum; and there is a hall about eighty feet long by forty broad—undoubtedly one of the finest in the colony for public assemblies and entertainments. Standing on the broad flight of steps at the entrance of this building, the Bayonian (as a resident here is termed) may feel proud as he surveys the unmistakable evidences of commercial enterprise and substantial wealth around him—all the growth of little more than sixty-five years' British colonization.

The fashionable quarter is on what is termed the "Hill,"—in contradistinction to the "town below"—a flat tableland, on the terraced ground above the Main-street. Its aspect and surroundings are very pleasant and enjoyable, as this height is generally fanned by fresh cool breezes from the sea. Many superior mansions and pretty villa residences have been erected here. There are also some handsome churches, such as St. Augustine's Roman Cathclic Church, the Scottish Presbyterian Church, and Trinity Church; an admirably managed Provincial Hospital; a well endowed collegiate establishment, the Grey Institute; and a well regulated Club, where, after the labours of the day, the mercantile class usually congregate for relaxation, and courteously extend their hospitality to visitors. On the open flat beyond the Hill, there is the attractive St. George's Park, laid out and maintained by the Corporation of the town. It has very agreeable walks through avenues of trees, shrubs, and flowering plants, and is ornamented with a fine conservatory, water basins, and grassy plots.

The country about Port Elizabeth is very bare and uninviting; but there are some localities such as the Red-house on the banks of the Zwartkop River, and the coast lands of Emerald Hill and Van Staden's River, which afford good suburban retreats; and the pleasant town of Uitenhage is within an hour's reach by railway.

Graham's Town is inland about 106 miles by rail from Port Elizabeth, and 43 from Port Alfred. Next to the beautiful environs of the Western metropolis, it is beyond question the most pleasant place of residence in the Colony. Embosomed in green hills—the spurs of the Zuurberg range—at an elevation of 1,760 feet above the sea, the city, with its broad streets lined with trees, and its houses interspersed with gardens, presents a thoroughly English appearance, and is an acknowledged and favourite health-

resort. The principal thoroughfare and business place is High street. At its upper end stand the old Drostdy buildings (now a public school) where the Colonial Parliament had its sittings in the session of 1864. Not far from it are the Botanic Gardens, where there is a conservatory erected to the memory of Colonel Fordyce, of H.M's 74th regiment, who fell in the Kafir war of 1851. In the middle of High-street stands the St. George's Cathedral, where in front of the communion table, a monument is erected to the memory of Col. Graham, from whom the city takes its name. Lower down the street is Commemoration Chapel, the principal place of worship of the Wesleyan denomination, erected to commemorate the gratitude of the British immigrants of 1820 for the blessings enjoyed by them in the Albany settlement.

Although much smaller than Port Elizabeth in point of population (its white inhabitants numbering about 7,000), and the coloured natives 3,000, Graham's Town ranks as the metropolis of the Eastern and Frontier Districts. It is a cathedral city, and the place of residence of the Bishops of the Church of England and the Roman Catholic Church, and the Superintendent of the Wesleyan body. It is also the seat of the Eastern Districts Court, with attendant judges, solicitor-general, barristers and members of the side bar. There are among its local institutions a Museum, a Natural History Society, and a Public Library. Formerly the city was the head-quarters of the military, and the residence of the Lieut.-Governor. The extensive military barracks are now appropriated to public uses. There is an excellent Public Hospital and a Provincial Lunatic Asylum. A spacious assembly room, the Albany Hall, is available for meetings and amusements, and there are various Masonic, Odd-fellows, Templars, and other societies, largely patronised by the inhabitants. The city has recently been connected by railway with its port, the Kowie River Mouth (Port Alfred), a favourite watering place.

King William's Town, or "King," as it is sometimes shortly termed, ranks as an important commercial centre, being on the highway from the harbour of East London to the interior, and from the Eastern Districts to the Transkei and Kafirland. It has also the chief command of the native trade, extending beyond the Border and north to Basutoland. The town itself is pleasantly situated, stretching along the banks of the Buffalo River, and connected by a branch line with the railway from East London to Aliwal North. At the western end is the native location. Next comes the military barracks and officers' quarters. Then there is the business part of the town, with its public buildings, churches, clubs, stores, and private residences; while more to the eastward is the German settlers' town, with its

thatched verandahed cottages; and beyond that the camp and head-quarters of our colonial defensive force. The Town-hall is a large and capacious building, reflecting credit on the place. Between it and the river is the Botanic Garden, with an area of about fourteen acres of alluvial soil of the richest description, where everything grows in the greatest luxuriance. On a rise, to the north, are the public offices, on which has been erected a memorial clock tower in remembrance of the Rev. J. Brownlee, who commenced the first mission station in Kaffraria on the site of the present town. Adjacent to this is the handsome and imposing edifice erected by Sir George Grey (and known as the Grey Native Hospital), for the purpose of breaking the belief of the natives in witch-doctors, by placing skilful medical treatment and maintenance within their reach, free of charge. It has now been established more than a quarter of a century, and the success of the Institution amongst the Natives, is proved by the number who travel hundreds of miles to seek medical and surgical aid, showing that the Kafir people are breaking through their race prejudices and acknowledging the superiority of scientific treatment of ordinary diseases.

Graaff-Reinet, the oldest and the largest of the towns in the midland districts, is situated near the centre of the Colony at the base of the hilly range where the Sunday's River leaves the Sneeuwbergen Mountains for the plains. These hills rise behind it to a height of 1,000 or 1,500 feet. The summit of one of them, the Spandeau Kop, has a rough resemblance to a haystack, and adjoining it there is a ridge of loosely-piled trap rock with pillars of columnar basalt, standing out in bold relief to the height of 300 or 400 feet, having a very picturesque effect. This spot is known by the name of the Valley of Desolation. At the foot of these hills, the Sunday's River sweeps round and forms a bend about a mile across, and in this bend the town is laid out, an abundant supply of water being distributed through it by several channels from the bed of the stream. The streets are wide, and many of them are planted with rows of trees on each side. The principal buildings are the Dutch Reformed Church, with its clock tower and spire, a handsome English Church, the Government Offices, the Town-hall, the College, Masonic Lodge, and the Public Library. There are several large and comfortable private buildings and stores of modern style, but the houses generally are of the old-fashioned type, with thatched roofs, gables and "stoeps," or terraces, the usual form of dwelling of the old colonists. Nearly all have vineyards, gardens, or orchards, or some spot of greenery attached to them. These give the town a very pleasing appearance, and its marked contrast with the surrounding arid Karoo plains obtained for it long ago the appropriate title of the "Gem of the Desert."

Kimberley, the inland terminus of the railway system, has advanced from the position of a mushroom camp to that of a permanent mining centre, presenting an industrial activity which compares favourably with any portion of the Colony. The population of the town and its adjacent mining townships is computed at between 25,000 and 30,000, more than one-half of whom are whites. Of late years considerable improvements have been effected in Kimberley; many of the temporary corrugated iron houses have been removed and given place to substantial and comfortable dwellings. The Bank of Africa, the Cape of Good Hope and the Standard Banks have each of them erected handsome and commodious premises; and the Kimberley Club-house, built at a cost of £18,000, is one of the most roomy and well arranged in South Africa. The High Court of Griqualand, the Post and Telegraph Offices, and the Town-hall, are also very spacious and commodious buildings; and the same may be said of the chief hostelry of the town, the Queen's, which was built at an expense of about £20,000. There are churches belonging to all denominations, and amongst the local institutions is the admirably-managed Carnarvon Hospital, where there is extensive accommodation for both European and coloured patients and admirable convalescent wards for the better class of invalids, who can pay for the same. The streets and roads, which extend over a distance of about 20 miles, are well laid out and kept in good order. The jewellers' and drapery establishments are fully as attractive as some of the same class in Regent-street; and there is an air of business and activity all over the place. The drainage of the town has lately been much improved; all sewage is carried outside its limits. There is a plentiful water supply brought in from the Vaal River, and available to the inhabitants for household and garden purposes, at a charge not exceeding 1s. 3d. per hundred gallons. The lighting of the town is effected by 32 electric Brush lights of 2,000 candle-power each. The daily morning market is generally a busy scene, crowded with groups of dealers and wagons, with their long teams of oxen, laden with produce from the Orange Free State, Bechuanaland, the Transvaal, and the far interior up to the Zambesi region. The value of produce sold in the Kimberley market annually is over £231,862 11s., and the number of wagons and other vehicles conveying produce to the market 18,185. On the adjacent Du Toit's Pan (Beaconsfield) market the value of produce is over £163,392, and the number of wagons and other vehicles 20,468.

There are several other country towns, such as Stellenbosch, the Paarl, Worcester, Beaufort West, Queen's Town, Cradock, Colesberg, and Aliwal North, of considerable size and importance.

The Colony is now divided for electoral purposes into seven

Provinces, and for fiscal and magisterial purposes into seventy divisions or districts. The following is an enumeration of the several provinces and divisions, and the chief towns and villages:—

Western Province.

Divisions and Districts.	Towns and Villages.
Cape Town	Cape Town and Green Point.
Cape Division Wynberg. Simon's Town.	Woodstock, Maitland, Mowbray, Rondebosch, Newlands, Claremont, Kenilworth, Wynberg, Constantia, Muizenberg, Kalk Bay, Simon's Town, Kuil's River, Blueberg, and Durban.
Stellenbosch	Stellenbosch, Eerste River, Somerset West, and the Strand.
Paarl	Paarl, Wellington, Drakenstein, Frenchhoek.

North-Western Province.

Malmesbury	Malmesbury, Darling, Hopefield, St. Helena Bay, Riebeek West, Mamre, Groenekloof.
Piquetberg	Piquetberg, Porterville, and Goedverwacht.
Namaqualand Port Nolloth.	Springbokfontein, Hondeklip Bay, Port Nolloth, Bowesdorp, and Leliefontein.
Clanwilliam Calvinia.	Clanwilliam, Troe Troe, Calvinia, Brandvley, and Katkop.
Worcester Tulbagh. Ceres.	Worcester, Ceres, Tulbagh, Steinthal, Gouda, Bergville, Hermon, Wolseley, and Prince Alfred.

South-Western Province.

Swellendam Robertson.	Swellendam, Heidelberg, Zuurbraak, Malagas, Port Beaufort, Robertson, Montagu, and Lady Grey.
Riversdale Ladismith.	Riversdale, Ladismith, and Amalienstein.
Caledon Bredasdorp.	Caledon, Genadendal, Villiersdorp, Greyton, Bredasdorp, Elim, and Napier.
Oudtshoorn	Oudtshoorn, Cango, and Calitzdorp.
George Uniondale. Mossel Bay. Knysna.	George, Blanco, Hopedale, Uniondale, Schoonberg, Pacaltsdorp, Lyon, Aliwal South, Plettenberg's Bay, Melville, Belvidere, Newhaven, Redbourne, and Edmundton.

Midland Province.

Graaff-Reinet Murraysburg. Aberdeen.	Graaff-Reinet, Petersburg, Aberdeen, and Murraysburg.
Beaufort Prince Albert. Willowmore.	Beaufort, Prince Albert, Petersburg, Willowmore.

Midland Province—continued.

Divisions and Districts.	Towns and Villages.
Victoria West Prieska. Fraserburg. Sutherland. Carnarvon.	Victoria West, Prieska, Fraserburg, Onderste Doorns, Kenhardt, Upington, Sutherland, and Carnarvon.
Richmond. Hope Town.	Richmond, Britz Town, and Hope Town.

South-Eastern Province.

Albany. Bathurst.	Graham's Town, Salem, Sidbury, Riebeek, Bathurst, Port Frances, and Port Alfred.
Victoria East Peddie.	Alice, Aberdeen, and Peddie.
Uitenhage Jansenville. Humansdorp. Alexandria.	Uitenhage, Jansenville, Humansdorp, Hankey, Alexandria, Paterson.
Port Elizabeth	Port Elizabeth, Zwartkops, and Walmer.

North-Eastern Province.

Fort Beaufort Stockenstrom.	Fort Beaufort, Post Retief, Adelaide, Heald Town, Elands Post (Seymour), Hertzog, Balfour, and Philip Town.
Albert	Burghersdorp, Molteno, Sterkstroom, and Ventersberg.
Somerset East. Bedford.	Somerset East, Groote Vlakte, Been Leegte, Pearston, Bedford, and Glenlynden.
Cradock. Steynsburg.	Cradock, Steynsburg, and Maraisberg.
Colesberg. Hanover. Middelburg.	Colesberg, Phillipstown, Hanover, and Middelberg.

Eastern Province.

King William's Town. Stutterheim Komgha	King William's Town, Berlin, Breidbach, Braunsweigh, Frankfort, Stutterheim, and Komgha.
East London	East London, Panmure, Potsdam, and Maclean.
Queen's Town. Cathcart. Tarka.	Queen's Town, Whittlesea, Tarkastad, Lady Frere, Glen Grey, and Cathcart.
Aliwal North Herschel	Aliwal North, Lady Grey, James Town, and Herschel.
Wodehouse. Barkly East.	Dordrecht and Barkly East.

Griqualand West Province.

Kimberley Herbert. Barkly West. Upper Hay.	Kimberley, De Beer's, Beaconsfield, Du Toit's Pan, Herbert, Barkly West, Pniel, Douglas, and Griqua Town.

THE PARLIAMENT HOUSES. (FROM PHOTOGRAPH BY MR. ALLIS.)—SEE PAGE 97.

POLITICAL AND CIVIL INSTITUTIONS.

During the occupation of the Cape as a Dependency of the Dutch East India Company from 1652 to 1795, all executive, legislative, and judicial authority was exercised by a Governor and Council, who were appointed by the Company and responsible for their proceedings to the directors in Holland. A similar form of administration prevailed from 1803 to 1806, during the time the Colony was transferred to the Batavian Republic—the Governor and Council, however, being no longer dependent upon a commercial body, but only subject to the supreme power of the State.

Under the British Government from 1795 to 1803, and afterwards from 1806, the Governors alone exercised all the power and authority, until, in 1825, an Executive Council was appointed to assist them. Ten years afterwards, in 1835, a Legislative Council, whose proceedings were open to the public, was established by Royal Instructions. The Council consisted of not more than twelve persons, exclusive of the Governor, who was president; and of these, six were persons holding office under the Crown, and the other six were selected from the chief landed proprietors and merchants, and nominated by the Governor. The first persons so nominated to the Council were:—P. L. Cloete, sen., J. B. Ebden, M. van Breda, C. S. Pillans, and J. J. du Toit, J. son.

By Letters Patent issued by Her Majesty Queen Victoria in 1850, this Legislative Council was authorised to enact ordinances for the establishment of complete representative Government; and by an Order-in-Council dated 11th March, 1853, what is termed the "Constitution Ordinance," providing for the creation of a Colonial Parliament, consisting of a House of Assembly and Legislative Council, came into force.

The Governor was empowered to have an Executive Council to advise and assist him, composed of the Colonial Secretary, the Attorney-General, the Auditor-General, the Treasurer-General, and the Collector of Customs—all of whom, with the exception of the last-named, were entitled to sit and take part in the debates and proceedings of Parliament. These officers, however, had no right to vote as members of the Legislature; and, although charged with the conduct of public affairs, were in no way required to enjoy the confidence and support of a majority of the electors or their representatives. Hence there occasionally arose an antagonism in action and policy between the Government of the day and the Parliament.

A change to the British system of Responsible or Party Government was proposed, and continued to be agitated for, at different periods afterwards; but it was not adopted until 1872. In that year an Act was passed by the Legislature, and received the Royal Assent, which provides that the members of the Executive Council may hold seats and vote in either House of Parliament. Under this authority, His Excellency the Governor now selects his advisers or "Cabinet Ministers" from among those persons possessing the confidence of the majority of the people's representatives, and who as such are responsible to the Legislature for the acts of the Government. These Ministers, once installed, hold office until they find that they are unable to secure in the Legislature the requisite support of their policy,—or the Governor deems it his duty to act on important questions in opposition to their policy and advice,—when they give place to others, in analogy with the usage prevailing in the United Kingdom.

While the gifts of Representative and Responsible Government have thus been conceded to the Colony, the Crown has still the prerogative of appointing its own Governors and of exercising a veto on all legislation; it also remains the supreme fountain of justice, to which ultimate appeals from the Judicatures of the Colony are preferred; and the Imperial Parliament holds its indisputable omnipotence over this, as over every part of the whole Empire. The Crown, however, exercises no control over any public officer, except the Governor. The direction of internal affairs, the management of departments, and the appointment to all public offices, rest with the Ministers forming the Executive Council.

The Ministry or Cabinet, who, together with the Governor and Lieutenant-Governor, form the Executive Council, is composed of:

A Colonial Secretary, whose office supervises the Civil Service throughout the various divisions of the Colony, and controls the Post and Telegraph Departments, Deeds Registry, Defence, Education, Hospitals and Asylums, and Police.

An Attorney-General, who is the law adviser and public prosecutor, and controls the Department of the Administration of Justice.

A Treasurer-General, who is the Receiver-General and Finance officer, and principal Collector and Controller of Customs and Excise.

A Commissioner of Crown Lands and Public Works, charged with the administration of the Land Laws and supervision of Railways and other public works, Diamond and other Mines, Irrigation, Forests, Agriculture, Lighthouses, and Harbours.

A Secretary for Native Affairs, who is charged with the management of all the relations with the aboriginal tribes.

All the above Ministers have permanent Under-Secretaries, or assistants, as heads of their several Departments.

Frequent change of Ministries was a noticeable characteristic of the Australian Legislatures, after they first entered upon their career of self-government, and it was prophesied that the same liability to frequent political crisis would be experienced at the Cape. But the prediction has not been fulfilled. There have been only four Ministries in office since 1872, and their average duration has been considerably over three years. The following is a list of them :—

MOLTENO MINISTRY.

From December, 1872, to February, 1878.

Premier and Colonial Secretary ..	Sir J. C. Molteno, M.L.A.
Treasurer of the Colony	H. White, M.L.C.
Attorneys-General	J. H. de Villiers, M.L.A. S. Jacobs, M.L.A. A. Stockenstrom, M.L.A.
Commissioners of Crown Lands and Public Works	C. A. Smith, M.L.A. J. X. Merriman, M.L.A.
Secretary for Native Affairs ..	C. Brownlee, M.L.A.

SPRIGG MINISTRY.

From February, 1878, to May, 1881.

Premier and Colonial Secretary ..	J. Gordon Sprigg, M.L.A.
Treasurers of the Colony	J. Miller, M.L.C. H. W. Pearson, M.L.A.
Attorneys-General	Thos. Upington, M.L.A. J. W. Leonard, M.L.A.
Commissioner of Crown Lands and Public Works	J. Laing, M.L.A.
Secretary for Native Affairs ..	W. Ayliff, M.L.A.

SCANLEN MINISTRY.

From May, 1881, to May, 1884.

Premier, Attorney-General, and Colonial Secretary	Sir T. C. Scanlen, M.L.A.
Colonial Secretaries	J. C. Molteno, M.L.A.
Treasurers of the Colony	C. W. Hutton, M.L.C. C. J. Rhodes, M.L.A.
Attorney-General	J. W. Leonard, M.L.A.
Commissioner of Crown Lands and Public Works	J. X. Merriman, M.L.A.
Secretary for Native Affairs ..	J. W. Sauer, M.L.A.
Minister without portfolio ..	J. H. Hofmeyr, M.L.A.

UPINGTON MINISTRY.

Entered on Office 13th May, 1884.

Premier and Attorney-General ..	Thos. Upington, M.L.A.
Colonial Secretaries	J. Ayliff, M.L.A. (*dec.*) J. Tudhope, M.L.A.
Treasurer of the Colony ..	J. Gordon Sprigg, M.L.A.
Commissioner of Crown Lands and Public Works	F. Schermbrucker, M.L.C.
Secretary for Native Affairs ..	J. A. de Wet, M.L.A.

The Legislature consists of two branches. The Lower House, or House of Assembly, numbers seventy-four members, elected to serve for five years, unless Parliament is sooner dissolved. It nominates its own Speaker and officers, and members residing beyond a certain distance from the seat of Government are paid an allowance of £1 per day, in addition to travelling expenses, for attendance during any session for a term of ninety days. With the exception of paid officers under Government (other than members of the Executive Council), any qualified voter may be elected as a member of the House of Assembly. The qualification required of voters is, being a born or naturalized British subject resident in the Colony for twelve months before registration, and an occupier of property of the value of £25, or in receipt of salary or wages of not less than £50 per annum, or not less than £25 with board and lodging. This very liberal franchise—approaching to universal suffrage—gives nearly every colonist the privilege of taking part either as elector or elected representative in the conduct of public affairs and in promotion of the welfare of the community.

The Upper House, or Legislative Council, consists of twenty-two members, who are elected by the same voters as the House of Assembly, but a property qualification is required for membership—namely, the possession of immovable property worth £2,000 or of movable property worth £4,000. For the election of members of the Council, the Colony was formerly divided into two constituencies or provinces (West and East); but, by Acts passed in 1874 and 1877, it has been divided into eight electoral circles or provinces, seven of which return three members, and the other (Griqualand West) one. The Chief Justice is *ex-officio* President of the Council, and the members are designated "Honourable."

The Parliament must meet once in every year, and oftener if necessary. Its sessions are usually held during the months from April to July, in Cape Town. The rules of procedure observed by its members are substantially the same as those adopted by the British Parliament. The journals, entries, and proceedings are made and recorded in the English language; but since 1882, debates and discussions may be conducted either in English or Dutch, but in no other language.

The great bulk of the law of the Colony consists of the Roman-Dutch Law, modified by the customs and laws of Holland, by placaats and proclamations up to 1824, and after that by the Ordinances of Council and of the Legislative Council, and by the Acts of the Colonial Parliament. There is also a large body of statute law, scattered throughout the Imperial statute book, which has force within it.

The highest Court of Judicature in the Colony is the "Supreme Court," which has its sittings in Cape Town. It has cognizance

of all pleas, and jurisdiction in all causes, civil, criminal, and mixed, arising in the Colony, over all persons resident and being within the Colony. It has, moreover, full powers to review, correct, or set aside the proceedings of all inferior courts of justice within the Colony, and may order the re-hearing of any important case before five or more judges.

The Court consists of one Chief Justice and eight puisne Judges, two forming a quorum. Three of these judges form the "Court of the Eastern Districts" sitting at Graham's Town; and three form the "High Court of Griqualand" sitting at Kimberley, the presiding judge in each of these Courts being entitled "Judge President." The Court sitting in Cape Town is usually composed of the Chief Justice and two judges.

There is also a Court of Appeal for hearing appeals from the Court of the Eastern Districts, or the High Court of Kimberley, or any Circuit Court. This court also sits at Cape Town, and consists of the Chief Justice, the Judge Presidents of the Eastern Districts and High Court respectively, and two other Judges.

From the judgment of the Supreme Court an appeal lies to the Queen in Her Privy Council, in case such judgment is given for, or involves, any claim to the value of five hundred pounds sterling, or directly or indirectly affects civil rights,—leave to appeal having been first obtained from the Supreme Court.

Circuit Courts are held twice in every year, at such times and places as the Governor directs. Such courts have each in their respective districts the same powers which the Supreme Court has throughout the Colony.

The Attorney-General has the right and duty to prosecute all crimes in all courts in the Colony, in person or by deputy; and the right of prosecution is entirely in his own control. He is aided by an assistant law adviser to the Crown. For the Eastern Districts, a Solicitor-General is empowered to exercise the functions of the Attorney-General in regard to all criminal business; and a Crown Prosecutor has similar powers and functions in Griqualand West.

There is a Vice-Admiralty Court, the Chief Justice being judge, which sits at Cape Town for the trial of offences committed on the high seas and for the adjudication of maritime disputes.

Besides these higher courts, there are courts of Resident Magistrates held in each town or division of the Colony; also Periodical Courts held in outlying villages; and Courts of special paid Justices of the Peace, who have jurisdiction within certain limits.

Justices of the Peace are appointed by the Governor; they keep the public peace, summon offenders, and witnesses, arrest criminals, and take examinations; they likewise take recognizances of men to be on their good behaviour, and attest declarations.

Field-cornets are also appointed by the Governor; and are bound to apprehend without warrant and to commit to prison any person who in their presence commits, or whom they have reasonable grounds to suspect of having committed, any crime. They conform to the special instructions of the Resident Magistrate, within whose jurisdiction their ward is situated. In cases of wreck, when their wards adjoin the sea they are bound to repair to the spot where the wreck occurs, and to use every endeavour to save life and property. The Commissioners of Police and members of the constabulary of a district are empowered to arrest persons for any crime or offence, and they are required to suppress all tumults and other breaches of the peace. The Colonial police force numbers 800 men.

Among other institutions, there is one connected with the transfer of land, which was established at a very early date by the Dutch East India Company, and is deserving of particular notice. It is the Government Department known as the "Deeds Registry Office;" which secures in a very simple yet perfect manner the registration of all titles to landed property and mortgages upon the same. The registry extends back to 1685, shortly after the Cape was first occupied by Europeans; and at any moment the purchaser of an estate may refer to and ascertain all the by-gone circumstances, servitudes, encumbrances, and other matters connected with any old property, without the troublesome complexity or enormous expense which attends the same proceeding in England.

Titles to land are in the first instance issued by Government, representing the Crown, and registry of such issue is preserved in the Surveyor-General's Office. All subsequent conveyance, transfer, or exchange of any property is required to be recorded at the "Deeds Registry Office," where regular entry is made of the description of the property, its extent, the name of the seller, the purchaser, and the amount for which it is sold. A duty of 4 per cent. on the purchase amount is paid to the colonial revenue on the sale of any property, and also a succession duty on properties bequeathed; and certificates of these having been paid are required to be produced before transfer is given.

The "Deeds Office" likewise provides for the registration of hypothecations and mortgages. To have any legal right or title, or to be effectual against creditors, all such bonds are entered in what is termed the "debt registry," which is indexed, and daily open to public inspection on payment of a small fee. No transfer of land can be obtained until after a settlement of these bonds, either by repayment, or by the mortgagee consenting to continue his loan on the securities of the new purchaser, or by the mortgagee consenting to transfer of the land.

Under this system the most perfect security is given to the capitalist, and the conveyance of landed property is made certain, simple, and economical. The Conveyancers, who are authorised to practise by the Supreme Court, satisfy themselves before passing any deeds that the transferer has a clear title to the property, and not merely a life interest in it; that there are no servitudes or prohibitory conditions in the way of transfer; that there are no mortgages upon it in the "debt registry;" that the diagrams are correct; and that the proper transfer or succession duties have been paid. Thus the largest, best-conditioned, or most involved estate, may be sold and transferred from one owner to another on a couple of sheets or less of paper; and the facilities are so great that the time occupied in passing any deeds is not more than about seven days. The Department also provides for a registry of all rights secured under the Copyright Act, the Trades Marks Act, and the Friendly Societies' Act.

The "Master's Office" is another very important department, charged with the performance of duties corresponding to those of a Master of Chancery and a Commissioner of Insolvent Estates combined. It rests with the Master to register wills, to control the proceedings of trustees or executors in the administration of estates and properties of minors, lunatics, and absent persons. He also regulates all proceedings in bankruptcy, and assists the Supreme Court in matters which it refers to him for report or opinion. The duties connected with the administration of minors' and absent persons' estates, are of a specially responsible character.

The inheritance of minors who have no tutors appointed by their parents, and the moneys in the hands of tutors-dative and curators-dative, after payment of the debts due by the estate and the amount required for the immediate maintenance of the person under their guardianship, must be paid into the hands of the Master, by him put out to interest, and the interest, when required, paid for their maintenance and education,—at one per cent. less than the usual rate of interest. The moneys thus paid into his office for account of minors, lunatics, and unknown and foreign heirs having no legal representatives in the Colony, forms what is denominated the "Guardian's Fund." The capital of this Fund amounts at present to about £600,000, and is invested partly in mortgage bonds under security of landed property, and partly in Government stock and debentures. The yearly interest at present allowed on minors' inheritances is at the rate of four and a half per cent. This ceases on their attaining their majority. Foreign heirs not having legal representatives in the Colony, are allowed at one-half of the legal rate current in the Colony, and for a period not exceeding five years. Their names and residences, where

known, and the amounts due to them, are published twice a year, namely, in July and in October, in the *Government Gazette*, also in the *London Gazette*, and other papers.

The Government is represented in each division or district by a Civil Commissioner or a Magistrate; in some cases the two offices being combined in one person. The civil commissioners are charged with the collection of all revenues as well as the administration of justice and other matters. In colonial terms, a "division" means the territory over which the authority of a civil commissioner extends; a "district," the territory in which a resident magistrate has jurisdiction.

In all the divisions there are local bodies termed Divisional Councils, elected by the ratepayers. To them is entrusted the repair and maintenance of roads and bridges, and the settlement of questions relating to land boundaries; and they have also to inspect and report upon Crown waste lands proposed to be offered for sale. In most of the towns there are Municipal Councils, elected by the householders, for the management of local affairs. These Divisional Councils and Muncipalities are empowered to raise revenues for their respective purposes, by the levy of rates upon landed properties, by tolls, and by licences. There are also Village Management Boards, and Public Health Boards. The receipts administered by the Divisional Councils amounted, in 1884, to £173,796 per annum; and by Municipalities to £541,851. The value of the fixed property throughout the Colony, for rateable purpose (exclusive of all the territories of Transkei, Tembuland and Griqualand East) is £37,799,508.

The defence of the Colony is provided for by permanent and volunteer forces, consisting of the Cape Mounted Riflemen (including the Cape Field Artillery), numbering 700 officers and men; the Cape Infantry Regiment, numbering 520 officers and men; and Volunteer Corps—artillery, cavalry, engineers and riflemen—numbering 3,223 men. The armament includes fifteen field-guns, and stores of Martini-Henry and Snider rifles and carbines. Besides the above, there is an auxiliary force, composed of the burghers and levies, comprising every able-bodied man in the colony more than eighteen and under fifty years of age (with certain exceptions), their numbers, according to the list, being computed at 46,000 burghers and 77,000 levies. In case of a call for active service, the first drafts are taken from those between the ages of eighteen and thirty years. For some years past, the annual expenditure on Colonial Defence amounted to over £200,000; but considerable retrenchment has lately been effected; and the vote for 1885-6 was £155,000. The outlay of the Imperial Government in 1884 on military services in the Colony is stated to have been £88,752.

From the period when the Colony became a British possession, contributions towards the support of the clergy of several denominations were granted by the Government at various times. In 1853 these grants amounted to £16,060 per annum; and by a schedule to the Constitution Ordinance that sum was set aside to be annually appropriated for the service of "religious worship." But the unequal distribution of this amount among the different churches, and the growing claims of new congregations excluded from a share in it, as well as the persistent agitation of the advocates of the "Voluntary Principle," finally induced the Legislature in 1875 to pass an Act providing for its gradual withdrawal and abolition. This Act secured the continuance of stipends during the life-time of existing incumbents, and to the successors of such of them as might die or resign before the expiration of five years from the taking effect of the Act. Existing incumbents appointed to vacancies where previous incumbents were in receipt of stipends, receive the same salary, whether more or less, as was paid to the predecessor in such vacancy.

The congregations of the different religious denominations in the Colony (exclusive of the Transkeian Territories) number as far as ascertained 383,765 members, 232,046 being classed as whites and 150,719 as coloured. Of these the Dutch Reformed Church numbers 162,739; Wesleyans 68,814; Church of England 57,895; Congregationalists, Independents and London Missionary Society, 33,065; the Moravian or United Brethren 10,053; the Rhenish Mission, 10,011; Roman Catholics, 9,694; Presbyterian (Free Church of Scotland), 8,646; and besides these there are Baptists, Lutherans, French Reformed Church, Free Protestant, and Hebrew, and Mahommedan Congregations.

Among the aboriginal tribes, various Christian Missionary Societies have their agencies; and their good influence in raising the natives, both morally, educationally and industrially, are acknowledged by all who observe their labours. The Government commission on Kafir Laws and Customs, which sat in 1881-82, and of which the present Premier was a member, bore its unanimous testimony to the good which has been and is being effected by them, and recommended that all the countenance, protection and support which may be possible should be extended to them. Dr. Dale, the head of the Education Department of the Colony, has truly remarked that every one who would honestly measure the result of these missionary labours, should extend the horizon of his observation some sixty years back, and contrast what the native population was then and now. Thousands of the heathen inhabitants of Kafirland have in the intervening period taken the first step towards civilization; have acquired handicrafts, engaged in

industrial trades, and accummulated fixed property; and many of them may proudly point to churches and chapels that have arisen chiefly from their own efforts, where large congregations, neatly-dressed and well behaved, now regularly assemble at the sound of the Sabbath-bell.

The heterogeneous population of the Colony may be classed under three main sections:—The first, comprising the inhabitants of European origin, English, Dutch, French, German, and other; the second, those of mixed race, who form the bulk of the domestic servants and day-labourers in the towns and villages; and the third, the aborigines, Kafirs, Fingoes, Basutos, and Bechuanas.

To meet the educational wants of this tripartite community, the system of Public Education has been adjusted, and consists of

(1). The Public and District Boarding and Day Schools, under local boards of management.

(2). The Mission Schools under the control of Religious or Missionary Bodies.

(3). The Aborigines Day Schools, trade-classes, and Training Institutions, in connection with Missionary Societies.

The Public Schools lead up to the Colleges, in which the course of study is regulated by the requirements for degrees in the University of the Cape of Good Hope, which is an examining body forming the copestone of the system of Public Education.

The Government co-operates with each section of the community in promoting education, by means of grants-in-aid from the public revenue.

The objects to which grants are appropriated under the provisions of the Higher and Elementary Education Acts are these:—

(1). Grant in aid of the general expenses of the University, and bursaries.

(2). Grants in aid of salaries of professors and lecturers in colleges, which offer facilities to students to qualify themselves for degrees in the University of the Cape of Good Hope.

(3). The half salaries of Principal and Assistant teachers in the three grades of Public Schools.

(4). The half salaries of superintendents and teachers of District Boarding Schools among the agricultural and pastoral population, and of Boarding Departments in connection with the Public Schools.

(5). Capitation allowances towards the maintenance of indigent scholars resident in District Boarding Schools, and aid towards the expenses of industrial departments connected with these schools.

(6). Aid towards the salaries of teachers of District Mission Schools under the direction of religious bodies, with the view of assisting the managers to provide secular instruction for the children of the poorer class, who are not reached through the agency of the Public Schools.

(7). Aid towards the salaries of teachers of Day Schools among the

Aborigines, Kafirs, Fingoes, Basutos, &c.; also of trade teachers in the Native Training and Industrial Institutions.

(8). Capitation allowances for part maintenance of native boys and girls, resident in Industrial Institutions and receiving general industrial training besides ordinary school instruction.

(9). Capitation allowances to native apprentices in the Trade Schools.

(10). Assistance in equipping schools with all necessary appliances, furniture, books, maps, blackboards, scientific apparatus, &c., sewing materials when a seamtress is employed to teach sewing and cutting out clothes; and tools for the native workshops.

(11). The training of Elementary Teachers.

(12). Schools of Art.

Through these several agencies, the primary instruction of all classes, without distinction of creed or colour, is sought to be promoted; and whilst at the same time, the superior instruction of those who aspire to professional pursuits and University degrees is not overlooked, special attention has been given to the instruction of native lads in trades, such as carpentry, waggonmaking, printing and bookbinding, &c., and to the training of native girls for domestic employments.

To encourage native lads to become skilled workmen, an allowance of £15 per annum, maintenance money, is made for those who, after one year's probation, have entered into a definite engagement with the authorities of the institution with which they are connected, for a further period not exceeding four years, nor less than two years, as apprentices to one of the following trades:—carpentry, waggonmaking, blacksmith's work, tailoring, shoemaking, printing, and bookbinding.

To encourage native girls to become habituated to and skilled in the performance of the duties of domestic civilised life, an allowance of £10 per annum, maintenance money, is made for those who, after three months' probation, have entered into a definite engagement with the authorities of the institution.

The day-schools among the aborigines are usually kept by native teachers who have passed the elementary Teachers' Examination; but the Trade-teachers are Europeans.

The managers of a school may provide for the religious instruction of the scholars at a time set apart by them for that purpose, in addition to the ordinary school hours; but no scholars may be compelled to attend at that time for religious instruction without the consent of their parents or guardians.

Freedom of action as regards education in the Colony has been promoted without any undue striving for uniformity, either in modes of teaching or results. Parents are expected to feel their obligation to educate their children; teachers have free scope for their zeal and professional experience; and local authorities

are encouraged to co-operate in maintaining their own schools in efficiency. Thus Parents, Teachers, and School Managers contribute to their own individual and collective interests; and the Government intervenes not to damp voluntary zeal, nor to check private and municipal efforts, but to foster the progress of Education; to keep alive a spirit of generous emulation among Teachers as well as Pupils: in short, to supply whatever appears to be defective in the local agencies, whether it be inadequacy of funds, weakness of control, or a low conception of the scope and methods of true education.

The latest statistics to June, 1885, are as follow:—

University and Colleges.

In the five Colleges aided in connection with the University of the Cape of Good Hope, there were 305 students;

of these 216 were preparing for Matriculation.
75 ,, for the B.A. Degrees.
and 14 ,, for the Survey Certificate.

Schools for the year ended 30th June, 1885.

I.	No.
Schools and Institutions in actual operation during some portion of the year	989
New Schools opened during the year	75
Schools closed during some portion of the year	85
II.	
Annual enrolment of scholars	75,713
Highest Quarterly Ditto	54,934
Daily attendance	39,034
III.	
Public Schools, Classes 1, 2, 3, and Farm Schools	328
Boarding Schools and Departments	54
Mission Schools	400
Special Institutions (Training and Art Schools, &c.)	5
Aborigines' Schools—Colonial	28
,, Transkei	92
,, Tembuland	42
,, East Griqualand	40
Total	989

The Government Expenditure for public Education for the financial year ended June, 1885, amounted to £95,000, including administration. Of this amount, the University and Colleges absorbed £8,000; the Public Schools, £28,000; the Mission Schools, £18,000 and the Aborigines' Day and Industrial Schools, £21,000.

The agencies which are supported for the education of the *white* population enjoy about 40 per cent. of the Government Grants; those for the education of children of *mixed* races about 19 per cent.; and the *Aborigines* day and trade-schools 21 per cent.

The Department of Public Education is directed by the Superintendent-General of Education, who is responsible for the administration of the grants in accordance with the School Regulations which have been assented to by both Houses of Parliament by resolution. A regular inspection of all Schools is maintained through a staff of Deputy Inspectors.

The Department encourages and co-operates with local efforts for the extension and improvement of elementary and superior education, and without interfering in the management and discipline of any schools presses upon the attention of managers and teachers such changes as appear desirable in the accommodation for the school and the teacher, the methods of teaching, the text-books, furniture, and other apparatus, as well as the discipline and general organization of the school. Teachers can obtain by results a merit grant or good service allowance as a recognition not of mere length of service but of distinguished merit, where a school is reported as excellent throughout.

Public Libraries, Museums, Botanic Gardens, and an Association for the Promotion of the Fine Arts, have been established and supported by the public, and partly by the State. One of the best things the Colony has to boast of is the handsome building in Cape Town containing under one roof the South African Library and Museum. The Library Hall is a fine room about eighty feet long by forty feet broad, well lighted and fitted with galleries and recesses, which are lined with bookshelves and books. It contains upwards of 40,000 volumes in every department of literature and science, besides the valuable collection presented by Sir George Grey, consisting of rare manuscripts, original editions of carly printed works, and many volumes illustrative of the native languages of Africa, Australia, and New Zealand. It is open and available for study daily to all classes of the community; while subscribers of from £1 to £3 per annum may take out one or more sets of books and periodicals for perusal at their homes. A narrow vestibule leads from the Library to the Museum, which occupies the other wing of the building, and is filled with a very interesting collection, numbering many thousand specimens of the mammalia, birds, fishes, reptiles, insects, and minerals.

The country Libraries are fifty-one in number, the most noticeable being one at Port Elizabeth which contains 14,758 volumes; one at Graham's Town containing over 7,000 volumes; one at King William's Town with 10,254 volumes; one at Graaff-Reinet with 5,150 volumes; and one at Alice (Lovedale) with 6,438 volumes.

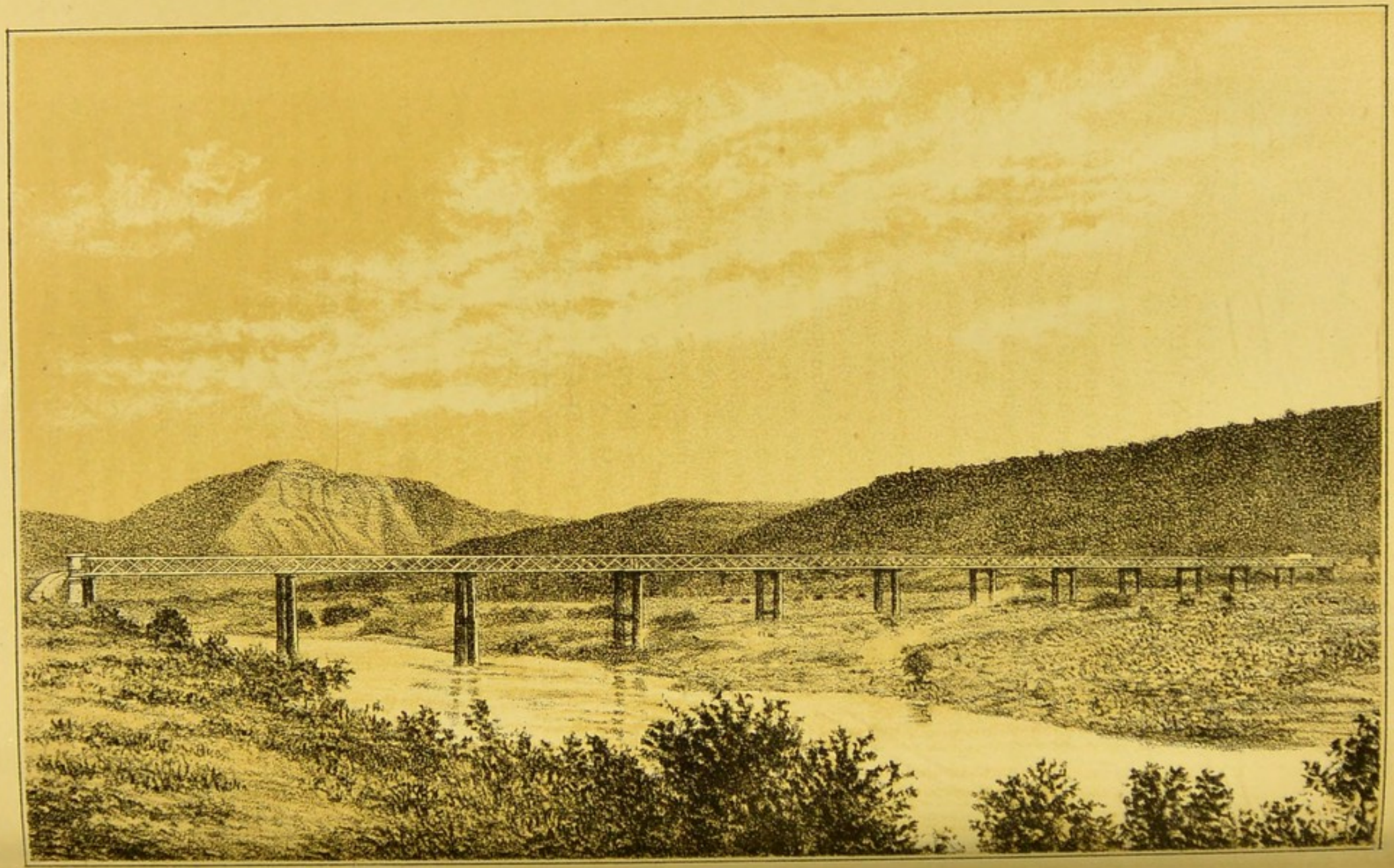
The Press, from its first establishment in 1824, has exerted a highly educational influence in the Colony. There are now 42 newspapers published in English; 22 in English and Dutch; 7 in Dutch; 1 in German; 1 in Kafir; and 1 in Kafir and English. Of these papers, 10 are dailies; 9 published twice a week; 14 twice; 38 once; 1 fortnightly and 2 monthly.

Of Benevolent and Charitable Institutions, the Government maintains a General Infirmary and Lunatic Asylum on Robben Island, at the entrance of Table Bay, and a Lunatic Asylum at Graham's Town. There are also commodious public hospitals at Cape Town, Port Elizabeth, Graham's Town, King William's Town, Queen's Town, and Kimberley. There is a fine roomy Sailor's Home, for the accommodation of seamen connected with Table Bay. Orphanages and other benevolent societies, under the care of philanthropic bodies, are voluntarily supported. There is an admirable Young Men's Christian Association in Cape Town; and Masonic, Odd-Fellows' and Good Templars' lodges are numerous throughout the Colony.

To foster habits of prudence and forethought, without which neither communities nor individuals can be prosperous, there is an old-established Savings' Bank Society at the metropolis, with some branches in the country districts, whose permanently invested funds now amount to £345,599. The Government Post Office Department has also opened Savings Banks at most of its offices since the 1st January, 1884, and the statement of business done from the opening up to 31st December, 1885, shows an excess of deposits over withdrawals of £174,000, which is invested under security of the public revenue.

The Postal service throughout the colony is well performed. There are 620 post-offices, and the estimated number of letters annually posted is six and a half millions. The postal rate for letters is one penny per half-ounce within town delivery; two-pence within the colony, or South Africa, and sixpence to England; to Continental parts an extra charge is made. Money can be transmitted by post-office or telegraph order; and, by parcel-post, parcels can be forwarded to or from any place in South Africa and the United Kingdom.

The Ocean Mail service with England is now a weekly one. By the contracts entered into with the Union Company and Sir Donald Currie's Castle Company, the voyage is required to be performed in 21½ days *via* Madeira or Lisbon, and 22½ days when St. Helena and Ascension have to be touched at. Premiums for speed at the rate of £6 5s. per hour, are given for passages completed under the allotted time. A postal subsidy of £25,000 is paid to each Company, instead of the proceeds of postage on the mail matter conveyed.



ROADS, TELEGRAPHS, RAILWAYS, HARBOURS, AND IRRIGATION WORKS.

The progress of the Colony is perhaps nowhere more apparent than in the improvements which have taken place in the means of travelling from the sea-board to the inland districts.

In a country with no rivers available for internal navigation, and where the physical features presented formidable obstacles to ordinary communication, its material advancement was heavily handicapped until roads were made, mountain barriers crossed, and rivers bridged.

Lord Charles Somerset was the first to commence the opening of the mountain passes by constructing a road over the French Hoek; and about ten years later, Sir Lowry Cole authorised the line of road across the Hottentots Holland Mountain, which still bears his name. In 1844, however, a system of public road-making was initiated by Mr. John Montagu, Colonial Secretary, which conferred most extensive benefits upon the community. He devised the construction of main lines of communication throughout the Colony, together with the advantageous employment of colonial convict labour upon them; and, aided by a public board of administration (the Central Road Board), and the professional services of Colonel Michell and Mr. A. G. Bain, as engineers, he was successful in carrying out to completion undertakings which, to use the language of Governor Sir Harry Smith, "would do honour to a great nation instead of a mere dependency of the British Crown."

There are now about 4,100 miles of constructed main road throughout the Colony, and the roads other than main roads, or as they are officially known, divisional roads, extend to fully four thousand three hundred additional miles.

Over such a great extent of communication there are necessarily a considerable number of bridges, and some of them are very large and important structures. The principal ones, however, are those which span the Orange River at different points. This river which traverses the continent almost from east to west, having its sources in the highest points of the Drakensberg mountain and emptying itself into the South Atlantic Ocean on the West Coast, is subject to great and heavy floods, due to its extensive drainage area, which is estimated at 400,000 square miles. The interruption to trade with the interior occasioned by the stoppage of traffic when the river was swollen after heavy rains, was felt to be a very serious drawback, and the Colonial Parliament, in 1874, authorised the river

being spanned by four separate iron bridges. That at Hope Town is the largest, being 1,480 feet long, and cost £114,260. The next in size is the one at Colesberg, measuring 1,339 feet in length, and which cost £108,726. There is another at Bethulie, 1,350 feet long which cost £78,874; and the fourth is at Aliwal North, 860 feet in length, and cost £59,904. The cost of construction was considerably increased by the heavy charges which had to be paid for the transport of the material (ironwork, &c.) from the seaports to the Orange River.

Another bridge, similar in design and structure to those over the Orange River, spans the Great Kei River, uniting the old Colony proper with the Transkeian territories. It is of iron lattice superstructure, resting upon iron piers filled with cement, and has thirteen spans of 94 feet 11 inches each. Its cost was over £49,000. This work was undertaken by the Government at the instance of Capt. Blyth, C.M.G., the chief magistrate of the Transkei, who urged the importance of it on the ground that a bridge over the formidable drift of the Kei River would secure free access to the Territory at all seasons, and have a most civilizing and beneficial effect upon the natives. The Fingoes themselves showed their appreciation of it by voluntarily contributing £1,500 towards making the approaches. The progress of construction was interrupted for some time during the war of 1877-78, but soon afterwards the bridge was completed, when the Kafirs significantly made the remark, "Now we see that we are conquered; the land of the Ama-settlers (British settlers) and of the Amakosa is one."

Electric telegraphs have been extensively constructed, and there are few towns throughout the Colony which are not in communication with the Metropolis. The total expenditure on purchase and construction of lines up to the end of 1884 was £351,000. The number of stations open and available in 1885 for the use of the public was 203, and the number of miles of wire, 8,663. The maximum cost of a telegram of ten words between the extreme points of the system (1,500 miles) is one shilling, with a charge of sixpence for every additional five words.

But the works which afford strongest evidence of the enterprise and progressive spirit of the Cape Colony are the extensive railways which have been undertaken chiefly within the last twelve or fifteen years. Railway communication was first projected during the governorship of Sir George Grey, who turned the first sod of the Cape Town and Wellington line on the 31st March, 1859. This line, 58 miles in length, was constructed by an English Company under a guarantee of a rate of interest of 6 per cent. per annum on a sum of £500,000. In 1862, private Colonial enterprise started a short branch line, from Salt River to Wynberg, without any guarantee or subsidy; and later on, another line

from Port Elizabeth to Uitenhage was commenced by a private company. All these lines, however, afterwards passed by purchase into the hands of the Government. In 1874, consequent upon the general prosperity resulting from the discovery and development of the diamond mines in Griqualand West, legislative authority was given for carrying on railway construction upon a large scale from the three principal seaports of the Colony, Cape Town, Port Elizabeth, and East London. These lines were subsequently authorised to be extended inland, until now they form three main systems, converging towards Kimberley and the Interior, and the Orange Free State.

At the commencement of the present year (1886), the total number of miles of Government railway open for traffic in the Cape Colony was 1,599 miles, purchased, constructed, and completed at a cost of £13,407,385. The following is an enumeration of the several main and connecting lines :—

Western System.

	Miles.	Total Milage.
Cape Town Dock to Kimberley . .	648	
Stellenbosch Branch	26	
Malmesbury Branch	29	
Salt River to Kalk Bay	15	
	——	718

Midland System.

Port Elizabeth to De Aar Junction . .	338	
Naauwpoort to Colesberg	38	
Zwartkops to Graaff-Reinet	178	
Alicedale to Graham's Town	35	
	——	589

Eastern System.

East London Harbour to Aliwal North	282	
Blaney to King William's Town . .	10	
	——	292
Total		1,599

These railways have been carried out on the 3 ft. 6 in. gauge, and with the exception of the Cape Town and Wynberg line, and the first seven miles of the Port Elizabeth and Uitenhage line, are all single lines. The general direction of the Western system is north-east, crossing the rivers forming the main drainage of the country, and intervening ridges, and the bridges are consequently both numerous and important. The Midland system runs north, following chiefly the main drainage of the country; while the principal characteristic of the Eastern system is its severe gradients and curves.

Some portions of the lines are, in an engineering point of view, highly creditable to the engineers who laid them out and superintended their construction. The entry into the Karoo over the Hex River range of mountains is specially worthy of notice. From the town of Worcester (780 feet above sea level) the line proceeds up the beautiful Hex River Valley, and then begins to climb the mountains by curves and zigzags along their sides, piercing some of the mountain spurs by tunnels, and crossing gullies spanned by viaducts, until within a distance of 36 miles it attains an altitude of 3,193 feet. Looking down from the top of the mountain there is a magnificent view of the valley, some 2,000 feet below; and the stupendous character of the engineering work by which the ascent has been accomplished can be fully appreciated. For upwards of twenty miles the line is steep in gradient (1 in 40 and 1 in 45), sharp in curve, deep in rock cutting, and precipitous in embankment. The highest point, however, is at Pieter Meintjes Fontein, 77 miles from Worcester, where a height of 3,588 feet is attained—a little higher than the summit of Table Mountain. Beyond this high level it again descends, being 2,717 feet at Buffel's River, and 1,537 feet (the lowest point beyond Worcester) at the Dwyka River; then ascending again, the altitude of 2,379 feet is attained between Prince Albert and Fraserburg Road, and it finally runs into Beaufort West at an altitude of 2,778 feet. From thence to Kimberley the Western line is on comparatively easy ground. The highest point (5,185 feet) on the Midland system is at Bosworth, near Naauwpoort, 164 miles from Port Elizabeth, from whence the country is generally flat to De Aar, the junction with the Western system, at 339 miles from Port Elizabeth and 500 miles from Cape Town. The Eastern system attains its summit (5,586 feet) on the top of the Stormberg range, 207 miles from the coast at East London. Owing to the nature of the country traversed, there is a large amount of waterway to be provided for. On the Eastern system there are eleven bridges of 100 feet opening and upwards, with a total waterway of 1,798 feet. On the Midland there are, including those across tidal rivers, fourteen bridges with a waterway of 4,229 feet; and on the Western, twenty-one such bridges with a waterway of 5,743 feet. The latter includes the bridge over the Buffels River, consisting of six spans of 100 feet each; that over the Geelbeck River, consisting of five spans of the same length; a third over the Blood River, consisting of seven spans; and a fourth and fifth over the Dwyka and Bitter Water Rivers, consisting respectively of four and seven spans of the regulation length.

The largest however is the "Good Hope" bridge spanning the Orange River on the Kimberley extension line. It is a substantial and magnificent piece of engineering skill. Its total length is

,230 feet, in nine spans of 130 feet each, plus the width of the piers. From the water to the rail, the height is fifty-six feet, and the weight is ninety-five tons per span, giving a total of 855 tons for the whole structure. The piers were commenced with the foundation being laid in July, 1884, and the erection of the girders in June, 1885, and the bridge was opened for traffic on the 28th November, 1885. The total cost of the bridge is estimated at £60,000.

For some years, all the rolling-stock and coaching required for the Railways was imported; but now well-equipped Railway Workshops have been established at Uitenhage and at Salt River, where repairs and transformations, as well as construction, are executed departmentally. Among other improvements carried out at these workshops, may be mentioned a most comfortable adaptation of the Pullman car, for through journeys from Cape Town to Port Elizabeth and Kimberley; and also a successful alteration of the locomotive engines, some of which are fitted up with long fire-boxes and ash-pans and an arrangement of movable bars, specially adapted for burning Colonial coal containing a considerable per centage of dross.

This Colonial coal is now extensively used on the Eastern system of Railways, from East London to Aliwal North; and contracts have been entered into by the Government for its regular supply. Three of the mines, Cyphergat, Molteno and Fair View, are in close proximity to the Railway line, on the Stormberg, while another mine, the Indwe, which yields coal of better quality, is distant some miles. The contract prices are for the former 16s. per ton, and the latter 25s. per ton. When a junction is effected between the Eastern and Midland systems, the whole of the Railways may be worked with Colonial fuel.

Taking the total cost of purchase and construction of the Government Railways, including rolling-stock, locomotive establishments, and raising of loans, the amount disbursed has been about thirteen and a half million sterling, or an average of about £8,613 per mile. The contribution towards interest on this capital from the receipts or earnings is equal to rather more than 2½ per cent. But it must be borne in mind that it is only now that the systems have attained completion, and some time should be allowed to realise the full benefit which must inevitably result from the stimulus given to the trade and resources of the interior by the recent opening of the Main Trunk Line to Kimberley.

The following table shews in respect to each of the last five years, the progress of the lines of Railway, the average length open, the earnings and expenses per mile, capital invested, cost per mile, the amount of passenger and goods traffic, and the quantity of working rolling stock, &c.:—

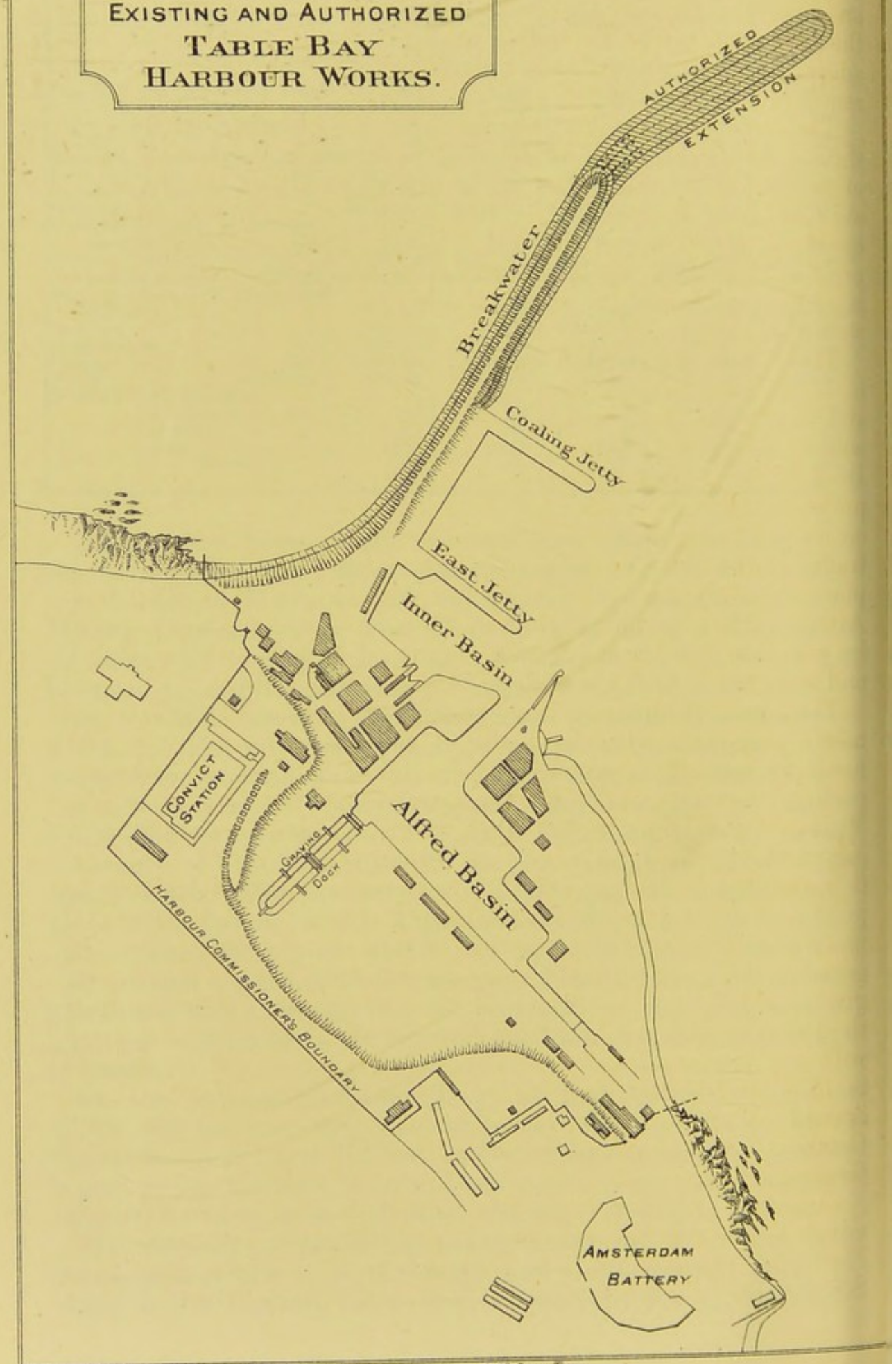
PARTICULARS.		1880.	1882.	1883.	1884.	1885.
Length of line On 31st Dec. each year.	Sanctioned miles	961	1,520	1,520	1,520	1,599·31
	Opened ... ,,	907	969	1,212	1,453	1,599·31
	To be opened ,,	55	552	307	68	...
Average length open ... ,,		882	962	1,089	1,344	1,483
Earnings per mile of line open £		726 17s. 6d.	1,006 15s. 4d.	840 9s. 5d.	717 18s. 8d.	699 10s. 0d.
Train miles run ... ... miles		1,873,081	2,892,878	2,603,468	2,412,604	2,765,989
Earnings per train mile ... s. d.		6s. 10·1d.	6s. 8·3d.	7s. 0·37d.	8s. 0d	7s. 6d.
Expenses ,, ,, ... ,,		4s. 11·5d.	4s. 11·8d.	4s. 11·87d.	5s. 3.4d.	4s. 10d.
Expenses per cent. of earnings per cent.		72·47	77·02	77·96	66·1	64·8
Capital invested on lines open £		7,990,403	9,275,540	10,487,417	12,104,757	13,407,385
Net receipts, per cent. of capital £		2. 4s. 2d.	2. 7s. 10d.	2. 10s. 8¼d.	2. 14s. 1d.	2. 14s. 5d.
Cost per mile to 31st December each year		8,810	9,582	8,646	8,850	8,613,4s.11d.
Earnings ... ... £		641,104	968,511	915,274	964,903	1,037,359
Expenditure		464,649	745,993	649,449	637,441	672,489
Passengers ... ... No.		1,324,406	2,435,895½	2,584,165	2,407,004½	2,428,586
Goods ... ... Tonnage		308,636	506,323	452,970	412,454	375,103
Working, Rolling Stock:						
Locomotives ... No.		120	183	218	227	227
Carriages ... ,,		252	290	340	291	320
Trucks ... ... ,,		1,848	2,575	2,928	3,025	3,146
Other Vehicles ,,		114	261	299	321	435

Besides the Government railway lines, there are others in the Colony constructed by private companies. One is in the mining district of Namaqualand, constructed by the Cape Copper Mining Company from Port Nolloth to O'okiep, a distance of 92 miles, and worked with mules. Another is the line which has been constructed from Graham's Town to Port Alfred, some 43 miles long, to which, however, the Government contributed a subsidy of £50,000. The principle of stimulating private enterprise in the construction of local lines, has also been adopted in reference to a line now in course of construction and equipment by the Central Railways Company between Worcester, Robertson, and Roodewal, a distance of about 40 miles, for which a subsidy of £75,000 has been granted. For the purpose of developing the valuable coal-fields at the Indwe, in the Wodehouse district, a subsidy of 1,000 acres of land and a grant of £50,000 (or in lieu of one moiety of that amount a grant of 25,000 morgen of land), have likewise been authorised to a Company for the construction and equipment of a railway connecting the Indwe with the Eastern system of railways at Imvani.

On the various Harbour Works of the Colony, a sum of £1,602,000 has been spent, out of moneys raised on the credit of the Government; and interest on the capital amount so invested is paid by the Harbour Boards of the several ports, out of revenues collected by them from dock dues, wharfage, and other sources.

The necessity of protecting the anchorage of Table Bay from the disastrous effects of the north and north-westerly gales to which it was exposed, led at various times to the production of

Plan showing EXISTING AND AUTHORIZED TABLE BAY HARBOUR WORKS.



Lithographed in the Surveyer Generals Dept Printed by Solomon & Cº Cape Town

lesigns for works having that object in view, which, together with in increasing demand for dock accommodation, resulted in 1860 in he formation of the Table Bay Harbour Board, and their ultimate doption of Sir John Coode's plans as the best suited to fulfil the required conditions of the port.

The first work undertaken was that of running out from the shore a Breakwater in a N. by E. ½ E. direction, formed of stones of varying sizes excavated from a quarry partly on the site of the old Chavonne Battery. The first wagon of stone was deposited by H. R. H. Prince Alfred on 7th July, 1860. During the progress of the Breakwater it was determined to convert the quarry in process of formation into a basin, and its form was modified with that object.

The Breakwater mound was completed to a length of 1,870 feet in July, 1868, having been carried out into 5½ fathoms of water, and it effectually protected a portion of the anchorage together with the dock and outlying works. These consisted of the Alfred Dock or inner basin having an area of 8½ acres, and an outer basin protected by a jetty 610 feet long, run out from the Breakwater on its south side at 970 feet from its root. They were opened for traffic on the 20th November 1869, and the formal ceremony took place on July 11th, 1870, in the presence of H.R.H. Prince Alfred. Prior to the completion of these works, the Board acquired by purchase the Patent Slip belonging to Messrs. De Pass & Co., and removed it to the south end of the Alfred Dock.

The means of repairing large vessels being still wanting, arrangements were made with the Lords of the Admiralty to assist with funds towards the construction of a Graving Dock of such proportions that it would suffice to accommodate the largest of Her Majesty's ship likely to visit these waters. Plans were accordingly prepared by Sir John Coode and approved of by the Imperial Government, but some difficulty as to certain restrictions both of priority and in matters of finance having arisen, the Harbour Board undertook the cost of construction themselves, and during the progress of the work an additional one hundred feet in length was given. This structure, which is built of granite (obtained from the Paarl 36 miles distant from Cape Town), will bear comparison with any similar work in the world. The foundation stone was laid in 1867, on the 24th August, by H.R.H. Prince Alfred. It was opened by the Governor Sir Hercules Robinson on the 20th October, 1882, and was named after His Excellency the "Robinson" Graving Dock.

Since its completion it has been largely used by vessels requiring either to be repaired or cleaned, and from the 4th to the 5th November of 1885, it was occupied by the White Star Line S.S. "*Coptic*" of 4,448 tons and 438 feet length, which had met

with the loss of one of the blades to her propeller. She was docked, a new blade affixed, and undocked in 24 hours.

During the construction of the Graving Dock, a timber jetty was erected 500 feet in length and 68 feet wide, running out from the Breakwater at 1,630 feet from its root for the accommodation of the large steamers from England to Australia and New Zealand requiring coal *en route*. A depth of water of 28 feet is here obtainable, and as much as 1,300 tons of coal has been put on board one of these vessels in 12 hours. At the same time a Quay wall, 600 feet long, was constructed parallel to the Breakwater between the above structure and the jetty forming the east side of the outer basin.

The rapidly developing trade of the port having rendered further increase of accommodation desirable, plans for works providing this were submitted, in 1880, by Sir John Coode, and sanctioned. To protect these, and in order to afford largely increased anchorage, an extension of the Breakwater was necessary, and authority was obtained in August, 1880. It was determined to lengthen the mound 800 feet in the same direction as the existing structure, and continue it a further distance of 1,000 feet in a north-easterly direction into 7½ fathoms of water. At the present time this work has been carried out a distance of 660 feet and is still proceeding, a total length of Breakwater of 2,530 feet having been constructed, which gives an extensive sheltered area of anchorage in Table Bay.

The bend referred to is already half finished, and each foot that the breakwater is now advanced will afford in proportion a much larger protected area than a similar advance did formerly. The quarry, from which the material for the breakwater is being excavated, is so designed that it may be made to give, with but small expenditure, additional dock accommodation of 8 acres, with a minimum depth at low water springs of 27 feet; an entrance would in that case be made through the West Quay immediately to the South of the entrance to the Graving dock.

The scheme, dated 2nd February, 1883, of Sir John Coode for an Outer Harbour of sixty-two acres has been adopted, and all the works are being carried on with due regard to its requirements. The mound of the South arm, which will run parallel to the breakwater at a distance 1,650 feet south of it, will shortly be commenced. This work will protect the Quay Wall between the East and breakwater jetties from the effect of seas due to South East winds, and make it available as additional berthage room.

The whole of the docks are most efficiently lit by the Anglo-American "Brush" arc and incandescent light system, and a well organized fire brigade and fire extinguishing apparatus are maintained. There is an adequate supply of excellent water, which is delivered on board vessels at 3s. per ton.

The increased importance of the trade of the port, largely due to the facilities now afforded to the shipping by the Breakwater and Docks, rendered it necessary that its defences against any attack of an hostile fleet should be considerably increased. With this object in view the Amsterdam Battery was greatly strengthened in 1879, by the deposit of surplus material in front of it from the Breakwater quarry excavation, and two new Batteries of considerable power have been erected this year, one at Mouille Point and the other at the South head of the Bay at Craig's Tower; the labour and tools for which were supplied from the Table Bay Harbour Works.

As the trade of the port has increased, the dock dues charged have been considerably reduced, and the following are the rates at the present time :—

Dock Dues on Goods.

Upon all goods landed from or shipped to ports or places beyond the limits of this Colony, "*bona fide*" in transit, or from distressed vessels, to be re-shipped, or coals, 2s. per ton.

Upon all goods transhipped, landed from or shipped to ports or places within the limits of this Colony, "*bona fide*" in transit or from distressed vessels, 1s. per ton.

On horses, mules, asses, horned cattle and ostriches landed, shipped or transhipped, 5s. each.

On calves, sheep, pigs and goats landed, shipped or transhipped, 3d. each.

On Vessels.

On all vessels entering the Dock or Basins with the privilege of remaining therein for twenty-one days, including the day of arrival and departure, per ton, 6d.

For every week or portion of a week after the above period, per ton in Docks or Basins, 2d.

On every vessel re-entering Docks or Basins within forty days from her first entrance on that voyage, per week or portion of a week, per ton, 3d.

On all coasters or craft of 50 tons and under, at per month of thirty days, per ton, 4d.

Note.—All vessels are charged at the above rates at per register ton gross, and are found in fenders and stages only.

All vessels, whether ships of war, transports, or belonging to the mercantile marine of any nation, visiting this port for coal or stores only, and not remaining more than eight days in Dock or at the Quays, and neither landing nor receiving cargo, will be charged at the rate of 4d. per ton, otherwise the charge will be 6d. per ton, as per Dock regulations.

On Ballast.

Stone Ballast put on board at per ton, 5s.
Earth Ballast do. 3s.

Ballasting vessels after hours, an extra charge of one shilling per ton will be made.

All ballast landed in the Dock to become the property of the Board.

Graving Dock and Patent Slip.

For docking and undocking vessels, or for taking up and launching from the Patent Slip, per ton register gross, including days of docking and undocking, or of taking up and launching, 2s.

The minimun charge, however, to be in no case less than £25 for the above.

Rent charge for Graving Dock and Patent Slip.

Vessels of 250 tons and under for every twenty-four hours' occupation of Dock Slip, £6.

Vessels above 250 tons for every twenty-four hours' occupation of Dock or Slip at per ton register gross, 6d.

All vessels taken into the Dock or on the Slip for the purposes of inspection or cleaning and painting only will be allowed a deduction of 25 per cent. on the above charges.

Sir John Coode is Engineer-in-Chief, and to him the successful development of all the works is due. The Breakwater, Alfred Dock, and outer Basin, were carried out under the immediate superintendence of Mr. A. T. Andrews, who was succeeded in 1871 by Mr. A. C. Jenour, during whose regime the extension of the Breakwater was commenced and the Graving Dock and Breakwater jetty, &c., constructed; he retired in March, 1884, and Mr. H. Thwaites is the present Resident Engineer.

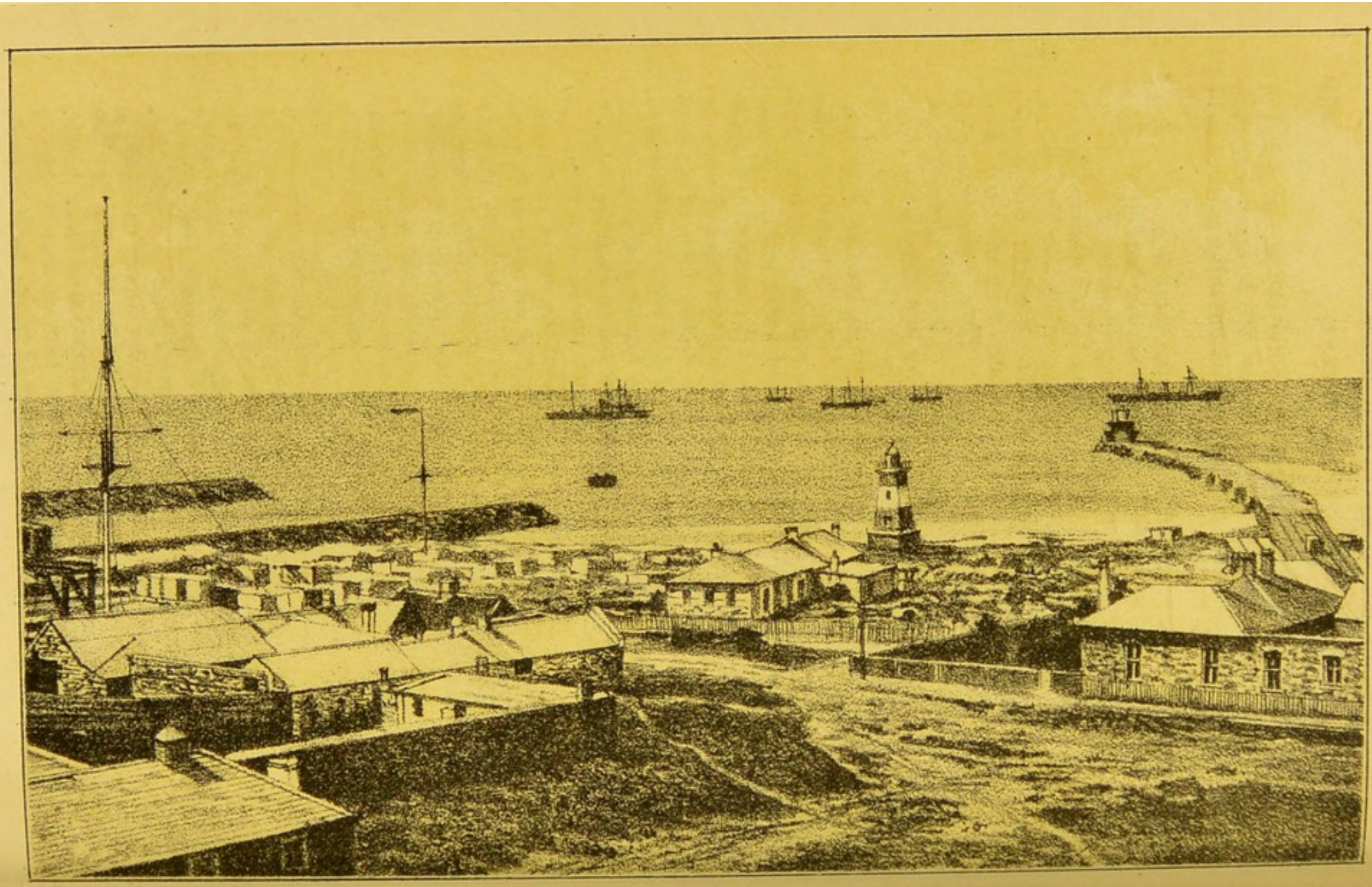
The cost of the entire works up to the 31st December, 1884, has been £1,273,078, while the revenue during the same period has been £938,048, the last yearly revenue being £72,197, which is sufficient to pay the interest of the money already expended or likely to be required to complete the works in hand and to provide for their proper maintenance. The comparative small cost of these important undertakings has been due in a great measure to the extensive employment of convict labour.

The total gross tonnage entered inwards and outwards in the year after the opening of the Alfred Docks was 110,058 tons, which had increased last year to 814,840 tons, the whole of the shipping arrangements being under the charge of Captain Hewat, the Dock Superintendent.

Simon's Bay is the naval station and dockyard for Her Majesty's vessels.

Mossel Bay, situate midway between Table and Algoa Bays, is from its geographical position the natural port for the central coast divisions of the Colony; there is a first-class lighthouse, an excellent harbour, warehouses, jetties, steam cranes, and other facilities for landing and loading cargoes.

Algoa Bay, the chief port for the eastern and midland districts, and the Interior, is an open but safe roadstead with good holding ground, and the loading and discharging of vessels are very expeditiously done by means of steam tugs and lighters and surf-boats, and gangs of native labourers. But this method, being found subject to occasional interruptions from the state of the surf, large iron jetties have recently been constructed and run into deep water; and these are fitted with steam and hand cranes, by which the landing and shipping operations are greatly facilitated. An elaborate scheme for an outer harbour capable of sheltering vessels of any size has been designed by Sir John Coode, who contemplates the construction of an iron viaduct extending seaward for a distance of 3,000 feet, and at its outer end a breakwater pier 2,000 feet in length in a N. by E. direction, having a depth of 33 feet at the



south or inner end, and 36 feet at the outer end at low water of spring tides. The estimated aggregate cost will be about a million sterling; but the prosecution of this large undertaking is at present in abeyance.

At Port Alfred (the Kowie River Mouth) there is good holding ground at the outer anchorage; and a steam tug and lighters for loading and discharging, or for bringing vessels of moderate draught (nine to twelve feet) into the river to the wharves, a mile from the entrance, where there are stores, a bonding warehouse, and the railway to Graham's Town. The harbour works were commenced many years ago by a private company, but were taken over by the Government in 1869. They were afterwards carried on, according to plans recommended by Sir John Coode, and designed to affect the flow of the river and tides so as to increase the depth of water at the entrance.

East London, at the Buffalo River Mouth, is another river harbour where similar works, under Sir John Coode's direction, have been in progress. These were intended to remove the "bar," and keep clear the passage to the deep reaches of water inside. Training walls, forming quays, were built so as to narrow the river channel and thereby increase the scour, and a breakwater of concrete blocks, like that of Portland, constructed in the form of an arm outside, to prevent the sea from checking the river's outflow and driving the sand back upon the bar. In former years occasional floods or freshets in the Buffalo River served to clear the "bar" sometimes to a depth of seventeen feet, and vessels were then able to pass inside and discharge cargo, without the use of surf-boats or the delays and risk attendant upon lying at an open anchorage outside. But since the works have been proceeded with, no freshets have occurred, and the sand accumulation has shallowed the entrance of the river. To remove this obstruction, in the absence of a freshet, a powerful dredger or sand pump has been ordered, and will shortly be at work to scour out the sand from the entrance, so as to enable vessels of large draught to utilise the spacious water accommodation inside the river's mouth.

Government, recognising the crude and unsystematic manner in which irrigation was generally conducted by private persons, and being desirous of affording them the benefits of professional advice, as well as of being inclined to commence large works on its account, in 1875 instituted the present Hydraulic Engineer's Department, with Mr. J. G. Gamble, M. Inst. C.E., as its head. Under the direction of this Department, the most likely districts of the Colony have been inspected, with a view either to the improvement of the method of irrigation in vogue, or the inauguration of large public works. Advice has been given to private persons and to public bodies and companies, and a large number of works for irrigation

and for town water supply have been constructed under the supervision of the Department.

With a view to encourage farmers and public bodies to undertake irrigation works, an Irrigation Act was passed by the Legislature in 1877. Under this Act, provision is made for the constitution of Irrigation Boards in districts, wherever three or more owners of land agree to act in combination for carrying out irrigation works, or the storage of water. The members of the board are chosen from and elected by the landowners. They have borrowing and rating powers, and the Government is authorised to assist them with loans of money on the credit of the rates assessed; but the character of the works to be carried out is in every case to be decided by a professional engineer appointed by the Government. Provision is also made for aiding individual proprietors and farmers desirous of storing water or irrigating their lands; they may receive assistance from Government in the shape of an advance, on undertaking to pay a rent-charge for the same at the rate of 8 per cent. for a term not exceeding 24 years. An Act passed in 1879 extended the provisions of the second part of the Act of 1877 to municipal bodies, thus enabling the Government to lend money to municipalities for the purpose of improving the water supply of the towns; and an Act sassed in 1880 introduced several further improvements.

The conditions under which loans for irrigation works may be obtained were republished in a concise form in 1885. They are briefly as follows:—

The loan must be secured by first mortgage upon the land on which the works are to be constructed, and will be granted for a term of any number of years, at the discretion of the recipient, not exceeding twenty-four.

The loan will be repayable, through the Civil Commissioner, by means of fixed annual payments varying with the term of the loan. For twenty-four years, the longest term for which money can be borrowed, the annual payments would be at the rate of eight per cent. per annum on the amount of the loan. For a less number of years the annual payments would be larger in proportion. The recipient of the loan will understand that after having made all the annual payments he is relieved from all further liability whatsoever, and will have discharged both principal and interest.

The annual payments above referred to may, at the discretion of the recipient, be redeemed at any time before the expiration of the term for which the loan is granted, by a payment calculated by a scale fixed for this purpose.

The existence of a previous mortgage or other incumbrance need not be a bar to a loan under the Irrigation Acts, provided the previous mortgagee or others consent to the preference of the Government Loan. The Government will give the necessary notices to the persons previously interested (if any), whether mortgagee or others: allowing a period of four months within which they may object to the preference of the Government Bond.

Land under mortgage for a loan under the Irrigation Acts cannot be transferred without the consent of the Government, and unless the rent-charge (or annual re-payment) is fully paid up.

The works must be constructed upon plans and specifications approved by the Government, who will bear all costs of inspection and examination of the scheme. If it be desired, designs will be furnished by Government free of charge; but in this case, to guard against loss, the applicant will be required to undertake to make good the cost of the necessary surveys in the event of the works not being carried out. Only where there is much measurement required will this guarantee exceed Ten Pounds (£10), and in no case will it exceed Fifty Pounds (£50).

Until the repayment of the entire loan the owner is bound to keep the works in efficient repair, and to certify once a year, through the Civil Commissioner, as to the condition of his work, under pain of an action for default and damages resulting therefrom.

The loan will be issued in instalments. One-fifth of the whole amount will be advanced upon the completion and registration of the Mortgage Bond, to enable the works to be commenced. Subsequent instalments will be paid on the certificate of the Hydraulic Engineer that sums previously advanced have been properly spent.

The facilities for making reservoirs, while more abundant in some districts than in others, are fairly plentiful in all parts of the Colony. This of course applies to ordinary farmers' dams. It is obvious that large works requiring special circumstances cannot be constructed equally well in all parts, yet there are numerous sites of the most promising kind scattered through the Colony, the utilisation of which is a mere matter of money directed by a little energy.

Calvinia has of late years been the scene of considerable dam-making, the works being constructed by the farmers from pecuniary assistance obtained from Government under the Irrigation Act. In that, as well as in numerous other districts, there are immense tracts of the most fertile land, which only need water to produce the most astonishing crops. An average of 70 bushels of wheat from one bushel sown can be relied on, while a return of 130 bushels is not infrequent.

In the division of Beaufort West, Victoria West, Prince Albert, Jansenville, &c., there are large reservoirs for the use of stock. Little use is made of them for irrigation, as the farmers prefer the less laborious occupation of sheep-farming. Griqualand West is not sufficiently diversified in character to admit of the construction of numerous reservoirs; there are, however, many farmer's reservoirs in existence. Some Karroo districts, owing to their flat character, are quite unsuited for reservoirs, while others which are intersected by low ranges of hills, afford at breaks in the range unrivalled sites for dams.

In the divisions of Worcester, Swellendam, Caledon, and in fact along the low ground at the foot of all the great mountain ranges, the configuration is well suited for reservoirs, but little use has been made of the sites.

In Oudtshoorn and along the sides of the Great Fish River the side valleys and kloofs are well adapted for dams. The drainage area of the Great Fish River is well worth a close investigation, for the land is of first rate quality, and its proximity to the railway admits of a ready market. A properly organised association, or a company more intent on developing the land than in speculating, could not fail to find this locality one of the best in the Colony for agriculture.

Farmers' reservoirs as ordinarily constructed, generally have many defects. They are seldom proportioned to the drainage area

from which they collect their supply: they are too shallow, the water seldom standing more than 12 feet against the bank, consequently there is a large loss from evaporation in comparison with the quantity stored. The embankment is nearly always wanting in strength, the base being to narrow, the slopes too steep, and the inner one seldom pitched with stones. As little provision is made for the escape of storm water the flow in floods overtops the bank and ends by breaching it.

In works constructed by loans under the Irrigation Acts, Government insist on proper designs and methods of construction, a course which is gradually introducing numerous examples of what reservoir embankments should be, but even in cases where the work is being done without aid from Government, experience is beginning to convince farmers that it is more economical to build a substantial dam at first than to rebuild an inferior one after every storm.

Until 1876 Government had not constructed any irrigation works, but in that year it sanctioned the construction of a small reservoir at Brand Vley, a small village in the division of Calvinia, about half way between the villages of Calvinia and Kenhardt. The work consists of an embankment which blocks up a "poortje" above the village, through which "poortje" a branch on the Zak River runs in times of flood. The embankment forms a shallow lake about two square miles in area when full, and averaging 5 feet deep. It was intended to make the depth greater, but the work required for this was omitted until Government should see what success the village will have. The water can be drawn off by means of a six-inch siphon, which was erected at a cost of £165. The total cost of the work has been £835, of which Government contributed £745, the erfholders finding the balance.

The reservoir, shallow though it is, has proved of great service to the neighbourhood, thousands of animals having been kept alive that would otherwise have perished for want of water. The value of stock thus saved must have long ago exceeded the cost of the work. But the usefulness of the dam is not confined to saving stock, for in 1879 eighty muids of wheat were sown on the village erven, from which a return of from 60 to 100 fold was obtained.

During the year 1882 operations were commenced by Government at Annshaw, in the division of King William's Town, for the purpose of supplying water to a native location. This work was undertaken in fulfilment of a promise made many years ago to Chief Kama by former Governors, in recognition of his loyalty during frontier troubles. This work consists of a furrow, 8 miles long, which conducts water from the Keiskama River to the lands occupied by the natives. The cost was slightly over £4,000.

In 1882, Parliament sanctioned the raising of a loan for con-

structing irrigation works on a somewhat extensive scale at Stolshoek, near Beaufort West, and at Van Wyk's Vley, in the Carnarvon division. The work at Stolshoek, completed in 1884, was undertaken for the purpose of irrigating a fuel plantation for the railway. The principal work is a masonry wall, which blocks up an opening in a low ridge of trap hills at the foot of the southern slope of the Nieuweldt mountains, thereby forming a reservoir having a drainage area of about five square miles, and capable of holding 96,000,000 gallons of water. The greatest depth of water is 20 feet. The wall is 500 feet long, 21 feet high, and contains 3,000 cubic yards of cement masonry, the cost of which was £2 7s. 6d. per cubic yard, exclusive of the cost of carrying water for mortar a distance of two miles. The water is conducted from the reservoir to the intended plantation in cast iron pipes. This work has cost about £8,700.

Van Wyk's Vley is by far the most important irrigation work which has been constructed in South Africa. The work is designed for the purpose of storing the rainfall so as to irrigate an extensive tract of fertile country, which without water is practically worthless. The drainage area of the reservoir is 460 square miles, an extent which to the casual observer would appear capable of yielding an immense volume of water. However, owing to the scanty and extremely irregular rainfall of the surrounding country, the flow into the reservoir is not in keeping with the extent of the drainage area. As an example of the scanty rainfall it may be mentioned that the averages for the years 1883 and 1884 did not exceed four inches. The works consist of an earthwork embankment a little more than 300 yards long, and 31 feet high at its highest point, a masonry tower at the inside toe of the embankment for drawing off the water, a masonry culvert containing cast iron pipes for leading the water through the embankment, and an overflow for storm water. The water is led to the irrigable lands in a large canal. The reservoir when full will hold 35,000 million gallons, and the extent of the water surface will be 19 square miles, with an average depth of over 10 feet. The greatest depth is 27 feet. The total cost of the work, exclusive of land, has been between £23,000 and £24,000.

The water supply of various towns have of late years been improved under the supervision of the Hydraulic Engineer's Department, and among them may be mentioned King William's Town, Queen's Town, East London and Port Elizabeth.

The old works which supplied King William's Town with water consisted of a weir on the Buffalo River, from which the water was led out by means of an open furrow to a turbine placed near the town. The fall of a large quantity of water was used to pump up a portion into a high level reservoir from which it was

distributed through the town in pipes. Unfortunately in dry seasons the flow in the Buffalo was too small to work the turbine, consequently the town had at these seasons to do without its high level service. In 1878 Mr. Gamble recommended the Town Council to lead out the Buffalo in pipes at a point high enough to bring the water into the town by gravitation. These works were begun about two years afterwards. The water is conveyed from the Izeli, a branch of the Buffalo, in cast-iron pipes, to a service reservoir commanding the whole of King William's Town. The length of the main from the intake to the service reservoir is 8 miles, and its diameter 10 inches.

The general features of the works constructed at Queen's Town are, a reservoir for the purpose of storing the storm-water from the Komani River, the water being conducted into the reservoir by means of a weir and furrow, a siphon to draw off the water, and a 6-inch main with distributing pipes and hydrants for the supply of the town. The embankment is 650 yards long and 31 feet high at the highest part. The reservoir is estimated to hold 80 million gallons of water.

At East London, the works comprise a reservoir in the Amalinda Valley which collects the rain water from the drainage area of the uppermost part of the valley. This drainage area extends to 1,500 acres. The surface is covered with green turf and studded with mimosa trees. The length of the embankment is 300 yards, and its greatest height, measured from the surface of the valley, 31 feet. The water area when full covers 26 acres, with a depth at the bank of 25 feet. There is a substantial masonry culvert through the embankment with a cast iron tower at its inner end for drawing off the water. This tower is the first of its kind in the Colony, if not in South Africa. From the storage-reservoir the water is led by a cast iron main to a covered service-reservoir $4\frac{1}{4}$ miles distant; thence it is conducted into the town by a main which delivers it into the distributing pipes. Hydrants are attached to the distributing pipes for fire-extinguishing purposes.

Until quite recently the water supply of Port Elizabeth was very scanty. The lower, or business part of the town drew water from a main laid along the beach from a small valley called Shark's River, in the sand-dunes between Port Elizabeth and Cape Recife. The upper part of the town, however,—where most of the best houses have been built—was dependent on underground tanks in which the rain caught on the roofs was stored. To remedy such a condition of affairs, a scheme was devised and approved by Mr. Gamble, for bringing in the water from the basin of "Van Staaden's River," over some twenty-eight miles of difficult, and in several places mountainous country, into the town. The work consists of a small intake weir in the mountains, from which a cast

iron main is laid to Port Elizabeth, communicating with and passing by a service reservoir at the highest point of the suburbs of the town. The present main was designed to carry 840,000 gallons per diem, but from actual measurement the main itself gave on one occasion 930,000 gallons and on another 960,000 gallons in twenty-four hours. The total cost has been about £130,000. The construction of these waterworks has very materially aided the expansion of Port Elizabeth, and numbers of houses and gardens have been built and laid out year by year on the "Hill," which has now very much the aspect of a neat, well-ordered English watering-place.

At Riversdale, Somerset East, George Town, Wellington, and Mossel Bay, gravitation works for the distribution of water have also been carried out; that at Mossel Bay costing £26,000, the length of piping being 22 miles.

At Beaufort West, a very large dam or reservoir has been constructed by the local Municipal Corporation. Previous to the formation of this dam the town was solely dependent for its water supply on two springs, the yield of which often fell to 20,000 gallons a day—a supply which was quite insufficient in the dry seasons. Accordingly the Municipal Commissioners constructed a reservoir by throwing an embankment across an opening in a ridge of low hills, thereby collecting the drainage from an area of 60 square miles. The capacity of the reservoir newly-made, under the supervision of Mr. Brand, in 1880, is estimated at 572,000,000 gallons. The greatest depth of water at the embankment is 19 feet, and the height of the embankment at its highest part is 25 feet. The cost of the works was £13,800. In 1883, the direct revenue derived from leasing new lands to be irrigated from the dam is stated to have been £1,000. The indirect revenue can scarcely be estimated, consisting as it does in a great improvement in the health and comfort of the inhabitants.

Another important undertaking—that of supplying water to the Diamond Fields at Kimberley from the Vaal River (a distance of 17 miles)—has been very successfully carried out by the Kimberley Waterworks Company (Limited), an English association, with a capital of £350,000. The intake is in the centre of the Vaal River, and the water flows through two eighteen-inch wrought iron pipes into a well 70 feet deep, built of stone in cement. At the head of the well in the engine house is a powerful A frame engine, which lifts the water from the well and forces it through eighteen-inch pipes into reservoirs or settling tanks, of which there are four, each capable of containing one million gallons. From these tanks the water is conducted through suction pipes, fourteen inches in diameter, to the main engines, by which it is now forced a distance of seventeen miles through fourteen-inch wrought iron

pipes into the storage reservoir at Kimberley, a height above the river of about 470 feet. The engine-house at the river is divided into three separate compartments:—the lowlift engine-house, where stands the A frame engine to lift the water from the well; the boiler-house, in which are four compound sectional boilers, and the main engine-house where are two 60 n. h.p. horizontal compound surface condensing engines which can be used separately or together as may be required. The engines and boilers were specially designed for this Company, and constructed by Messrs. Simpson & Co., of London. In the first instance, it was thought advisable to break the distance and lift from the River to Kimberley, and an intermediate Station, about halfway between the two points, was accordingly constructed. At this station there is a reservoir of a capacity of 300,000 gallons, and an engine-house containing two horizontal engines and three boilers precisely similar to those at the river. The water was originally pumped from the reservoirs at the river into this one, and thence almost simultaneously pumped to the storage reservoir at Kimberley. After numerous tests and experiments it was found to be feasible to pump direct the entire distance from the river to Kimberley, and consequently the intermediate station is not now in use.

The storage reservoir at Kimberley is a large circular basin, constructed at the highest point above the town, and capable of containing ten millions of gallons. The water for consumption in the town is conducted through 14-inch pipes to the filtering reservoir (200,000 gallons) in the vicinity where, after being filtered, it is discharged into a clear water reservoir adjoining, capacity 300,000 gallons, and thence flows by gravitation through a 14-inch wrought iron pipe into the heart of the town, and is then distributed through branches of 6 and 3-inch cast iron pipes. There are mains through nearly every street and a large number of hydrants have been fixed for the protection of property.

The town system is divided by means of valves into 24 sections, so that while one section may be undergoing repair the general supply is not interrupted. The condition of the water for use in the mines being immaterial, the four mines, Kimberley, De Beer's, Dutoitspan, and Bultfontein are served direct from the storage reservoir. There are now about seventy miles of mains laid. Mr. F. R. Despard, As., M.I.C.E., is the manager and superintending engineer.

CAPE WOODS AND FORESTS.

By A. W. Heywood, Forest Department.

The large forests of the Colony exist in the temperate regions of the Southern mountain chains near the sea, running almost parallel to the coast. Altogether these wooded tracts cover an area of something over 350 square miles. About one-half of this forms a nearly continuous strip in the Divisions of George, Knysna, and Humansdorp, constituting the Conservatorship of Knysna. The other half (the Conservatorship of King William's Town) is situated in the Amatola mountains and subsidiary ranges, in the Divisions of Stutterheim, King William's Town, Victoria East and Stockenström. There are also some small patches of high timber forests in the Fort Beaufort Division, and a larger area in the Zuurberg mountains of the Uitenhage Division; in addition to which, the Eastern forests comprise about 50 square miles of low but valuable forest partially demarcated near the coast.

The Transkeian Territories lately annexed to Cape Colony are reported to contain many fine forests; but their extent is not accurately known, nor have they as yet been placed under the administration of the Forest Department. They are said to abound in both the Stinkwood of the Western, and the Sneezewood of the Eastern forests, a circumstance unknown in the older portions of the Colony.

Until within a recent period, the management and working of the Cape forests was of a very unsystematic and thriftless character. Fellings were not confined to limited areas or sections; woodcutters were allowed to pick and choose their trees indiscriminately throughout the forests, and to pay only for the wood actually removed. The consequence of such a method was that only the choicest trees were felled, and their rejected portions left to cumber the ground. It has been estimated that by working on this system nearly thirty cubic feet of wood were wasted for every one utilised and paid for. Natural reproduction was thus severely handicapped; many forests disappeared altogether; and those which now remain and are at all accessible, have been impoverished to the last degree.

In 1880, the question of forest management was brought before Parliament. It was pointed out that the officers in charge had received no special training for the work which had in conse-

quence suffered severely, and the salary for a trained forest officer was voted by the Legislature. The Crown Agents in London were consulted, and with the assistance of Colonel Pearson, then at Nancy, the services of Count de Vasselot de Régné, of the French Forest Department, were secured. This officer arrived in Cape Town early in 1881, and as Superintendent of Woods and Forests undertook the organisation of the present Forest Department. In 1883, by the courtesy of the Indian Government, the services of Mr. Hutchins, Deputy Conservator of Forests, were made temporarily available to the Colony.

Count de Vasselot first set about the introduction of a proper management scheme for the Knysna and adjoining forests, whilst Mr. Hutchins proceeded with the demarcation of Reserves in the King William's Town and neighbouring divisions.

KNYSNA AND TZITZIKAMMA FORESTS.

Having regard to the conditions prevailing at George, Knysna and Tzitzikamma, Count de Vasselot adopted the method of dividing the forests into blocks, and sub-dividing them again into sections. Fellings now proceed regularly in bi-annual sections, so that the re-growth in the first section cut may develop into mature trees by the time the working of the last section is finished, and there will thus be no occasion at any time to close the entire forest. The period for the "revolution" of fellings has been fixed at 40 years. (For a full description of the system adopted see *Introduction to Systematic Forestry:* Cte. M. de Vasselot.)

The forest staff at the Knysna consists of one Conservator, 3 officers of the higher grade, and 6 forest rangers or guards.

The work of each officer of the higher grade extends over an area varying, according to circumstances, from 10,000 to 30,000 acres. The timber, or high forests, are surveyed by him. He determines the boundaries of series or blocks, and draws up working plans for the formation of sections. All working schemes are submitted to the Superintendent of Woods and Forests, and after approval the lines are opened, sections surveyed, and trees available for felling counted and stamped.

The total forest area in the Knysna conservation is approximately 100,000 acres, of which about three-quarters have been considerably exhausted by reckless and indiscrimate felling. Notwithstanding this, sixteen series or blocks have already been formed and twenty-one sections opened for felling. No working is allowed under any circumstances in forests not properly surveyed and demarcated. Two-thirds of the Knysna forests have yet to be so treated. It is estimated that these forests, even in their present condition, properly worked, will yield annually 1,200,000 cubic feet of squared timber valued at £15,000 at licence rates.

The tariffs for standing trees at present in force at Knysna vary from one penny to three pence per cubic foot of sound wood, with one exception, Stinkwood, for which the rate is fixed at one shilling per foot, as this, the most valuable species, was threatened with extermination. Poles from six inches to ten inches in diameter are sold at one penny per running foot; spars from four inches to six inches in diameter, sixpence per 100 running feet.

The following list includes the principal woods found in the Knysna forests. The weights and cost of working have been calculated by Messrs. J. Bisset, M.I.C.E., and Henry Hall, F.R.G.S.:—

Common Name.	Botanical Name.	Weight of a cubic foot (dry) in lbs.	Cost of working Fir = 1.
Upright Yellowwood ..	Podocarpus latifolius ..	35	1·35
Outeniqua do. ..	Do. elongatus ..	36	1·35
Black Ironwood	Olea laurifolia.. ..	64	2·00
White do.	Vepris lanceolata ..	71	
Stinkwood	Oreodaphne bullata ..	54	1· 6
Olyvenhout (Olive) ..	Olea verrucosa	72	2· 0
Assegai	Curtisia faginea	66	1· 5
White Pear	Pterocelastrus rostratus..	51	
Kersenout (Candle wood)..	Do. variabilis ..	68	
Wit Els (White Alder) ..	Platylophus trifoliatus ..	38	1·25
Saffraan	Elœodendron croceum ..	54	
Quar	Euclea undulata	63	
Vlier (Wild Elder) ..	Nuxia floribunda ..	47	
Red Els (Red Alder) ..	Cunonia Capensis ..	47	1·60
Essenhout (Cape Ash) ..	Eckebergia Capensis .	48	1·40
Hard Pear..	Olinea Capensis .. .	68	
Beukenhout (Beech) ..	Myrsine melanopleos ..	47	
Kamassi (Cape Box) ..	Gonioma Kamassi ..	58	
White Wood		48	
Zybast	Celastrus acuminatus ..	64	
Zwarthout		68	
Red Wood	Ochna arborea		
Melkhout (Milk Wood) ..	Mimusops obovata ..	68	1·75
Red Pear	Scalopia Ecklonii ..		
Zwart Bast (Black Bark)..	Royena lucida	55	
Klip Els (Rock Alder) ..	Plectonia mundtiana ..	55	
Terblantz	Protea sp.		

The great difficulty attending the preparation of all Colonial woods has been to overcome their excessive tendency to warp and

crack when dried. It is hardly possible to successfully season wood in open yards, so dry is the climate, and so great the daily range of temperature. The question of the most suitable time for felling is therefore of the greatest moment, and has been carefully considered by Count de Vasselot, whose remarks on this subject are of considerable interest. He says:—

I am of opinion that the period for felling all wood (in the Colony) should be between the 1st of April and the 31st of August, and that a felling season of three months is long enough for any species. Thus if a species be of late vegetation (as the assegai for instance in 1884), the cutting season might be limited from the 1st of May or even the 1st of June to the 31st of August; and in the same manner if species commence vegetation early, the season might be from the 1st of April to the 1st of July. (Selection and Seasoning of Wood. Count M. de Vasselot).

Nearly 50 per cent. of the total yield of Colonial high timber forests consists of the two species of yellowwood (*Podocarpus latifolius* and *P. elongatus*). Of these the former, or "Upright" has sometimes been called the "real" or true yellowwood, but its claim to such title is open to dispute. The name is derived from the Dutch "opregte."

The latter, or Outeniqua yellowwood, attains larger dimensions than any other tree in the Colony. Its crown is massive, frequently sixty feet in diameter, and its trunk short and bifurcated.

Upright yellowwood, on the contrary, has a comparatively light covert, and a greater length of bole. It is difficult to distinguish between the wood of these species; both are of a light-yellow colour, and very close grained, but the bark of the Upright is of a whitish appearance, and fibrous, whereas that of the Outeniqua is almost black, thin, and scaly. The largest Outeniquas measure thirty feet in girth and about eighty feet in height. Upright, though sometimes found with a clean bole of fifty feet, does not average more than six feet in girth. Both species have an equal commercial value, and may be regarded as the "Colonial pine."

The economic career of yellowwood has been somewhat chequered. The floorings, ceilings, doorways, and window sashes of many old Colonial homesteads were made of this wood, and instances are numerous of its having withstood the influences of wind and weather for upwards of a hundred and twenty years. Some of the piles used in constructing the old jetty at Knysna were of yellowwood, and for twenty years remained sound and untouched by the voracious *teredo*. On the other hand sleepers of unpickled yellowwood have been known to rot in the second year after they were laid down, and their average duration has not exceeded four or five years.

In cases where reliable information has been forthcoming, it has

been ascertained that much of the wood giving unsatisfactory results had been felled in Spring after the sap had risen, and employed in an utterly unseasoned condition. In one instance, green wood cut in summer had been coated with tar. The sap was thus shut in, evaporation prevented, and rot was the natural sequence. With results so variable, large consumers of timber have systematically avoided yellowwood, but it has been demonstrated that the wood has has not been fairly tried, and that failures have resulted not from any inherent defect, but from improper felling and carelessness in seasoning.

In 1877 twenty-four railway sleepers were experimentally creosoted in England, and laid in the Cape main line. For the purpose of examination, five were taken up in 1883, and found to be sound, and the remainder, half Upright and half Outeniqua, are still in the ground. Further experiments, made by Messrs. J. Bland & Co., of Cardiff, S. Wales, in 1883, demonstrated that yellowwood readily absorbs creosote, and is capable of resisting the various shocks and strains to which a railway sleeper is subjected, more effectually than the Baltic fir now principally in use. The success of these trials induced Government to purchase saw-mills at Gouna, near Knysna, and to erect a creosoting apparatus capable of turning out a sleeper supply sufficient for the whole Colony. This work has already been taken in hand by a special Government department. Contracts for 50,000 sleepers have been entered into, and a first shipment of 10,000 forwarded to Cape Town, creosoted and ready to lay down.

Besides the creosoting method, experiments are also in progress for the protection of yellowwood by the injection of chloride of zinc, a process attended with marked success in Holland.

The result of this extensive trial is awaited with considerable interest. If successful the Baltic sleeper will be superseded so far as Cape Colony is concerned; for her forests are well able to yield the supply necessary to maintain existing lines, and it is expected that other woods, notably Ironwood, will be found equal to the service. For 1886 requirements are estimated at 80,000 sleepers.

Large sums have been annually voted by Parliament for forest conservation purposes with as yet but small return so far as revenue is concerned. If, however, Yellowwood proves itself the good wood its few friends believe it to be, and can be manufactured at a price to compete with Baltic fir, then the large amounts annually sent abroad, £83,000 in 1883, and £44,000 in 1884, for the purchase of sleepers may be retained within the Colony, and encouragement will be given for more extensive schemes of conservation.

The most valuable timber grown in the Knysna forests is undoubtedly Stinkwood (*Oreodaphne bullata*). About one-eighth of the wood marked for felling in these forests consists of Stink-

wood. In organic structure the wood bears a remarkable resemblance to Burmah teak, and has been called the "Teak" of South Africa. Stinkwood naturally reproduces itself with great facility from seeds and coppice shoots, but as a nursery tree its qualities have not been ascertained. Its growth is rapid: perhaps more rapid than that of any other indigenous tree in the Colony; as few as six annual rings of growth are frequently counted to the inch.

Three distinct varieties are produced by this species,—white, mottled, and black, owing to different conditions of growth. When freshly worked a somewhat disagreeable odour is exhaled from the wood, but all unpleasantness quickly disappears. Stinkwood has been extensively used for building purposes and wagonmaking. The black variety is highly prized for cabinetmaking. It takes an excellent polish, and has a wavy irridescent appearance; otherwise it is not unlike walnut. Used as railway sleepers, Stinkwood has lasted ten or twelve years in the ground, but it has now become too valuable for the purpose. The high prices obtained for logs, and the former relatively low licence rate for felling, naturally led to a large trade in this wood to the neglect of other species, and to the detriment of the forests. Stinkwood was therefore fast disappearing, and in 1883 the licence was raised to one shilling per cubic foot, a higher rate than for any other Knysna woods.

As with all Colonial woods the greatest care is necessary in seasoning Stinkwood. The climate of the country is such that the period of repose in vegetation is very short, and not easily determined; the difficulty of taking trees at the moment they contain their minimum of sap is therefore correspondingly great. Added to this the extreme dryness of the atmosphere induces a too rapid evaporation of the moisture in the wood, and splits and cracks can only be avoided by the greatest care. A trial has been made to overcome these difficulties by immersing the wood in brackish water for three months. Three hundred logs intended for the construction of railway rolling stock, have been thus treated. The results so far appear satisfactory, but too short a time has elapsed to report fully on this process. When successful methods for its preparation have been discovered, and when the measures now adopted for restoring and improving the forests shall have produced an increased supply, it is not too much to expect that Stinkwood will be used in the manufacture of all Colonial rolling stock, and the importation of this considerable item discontinued so far as the woodwork is concerned. The quantity of Stinkwood available for felling in 1885 in the surveyed portions of the Knysna and Tzitzikama forests was 65,500 cubic feet, valued at licence rates at £3,132, and worth £11,500, delivered in Cape Town.

The order JASMINACEÆ is represented in the Knysna and Tzitzikama forests by three principal varieties: *Olea verrucosa* (olive

wood, or Olyvenhout); *Olea laurifolia* (Black Ironwood); and *Olea faveolata* (Bastard Ironwood). The wood commonly called white Ironwood (*Vepris lanceolata*) belongs to a totally different order, Xanthoxyleæ.

Black Ironwood largely predominates, and constitutes about one-sixth of the contents of these forests. It is extremely hard, heavy, and difficult to work, and its economic uses in the Colony are few. For furniture, wagonmaking, and fencing poles a small quantity is consumed, but its testings as railway sleepers (uncreosoted) have not been sufficiently encouraging to justify its extended use for this purpose. Trials have not yet been made of its durability when creosoted. They are, however, proposed, and if successful Ironwood will form a valuable supplement to Yellowwood in this service, and the forests will be greatly benefited by the removal of large quantities of mature timber now simply rotting away.

Under instructions from Sir John Coode, Ironwood has been experimented on for piles at Yarmouth (where only American Greenheart can endure), and of seven species of Cape hardwoods, excluding Sneezewood (*Pteroxylon utile*) which was not tried, it has best withstood the action of the sea-worm. On the Breakwater at Table Bay, it is used above water, but below is rapidly attacked by the teredo.

Black Ironwood takes an excellent polish and is peculiarly marked. Selected logs might be exported with profit for the manufacture of mechanical appliances, engine-bearings, &c., requiring a hard, heavy, close-grained wood.

Of other Knysna trees none attain the dimensions of those already described. For the most part they are hard, tough, close grained, and principally used in the construction of carts, wagons, agricultural implements and for fencing poles and furniture. For cabinetmaking of a high class, some Cape woods might be exported with advantage. Hard Pear, Wild Olive, Kersehout, Essenhout, Red and White Els are specially worthy of notice.

For the requirements of the colonial wagon-making industry, the Knysna woods are admirably adapted, possessing all the toughness and elasticity necessary to withstand the perpetual shocks and strains occasioned by roads, in some localities of the very worst description. The ordinary load of a transport wagon is 10,000 lbs., and the usual team consists of sixteen oxen, though in some mountain passes a double team is required. In the Western Province, the Paarl and Worcester are centres of the wagon-making trade. In the prosperous years following the discovery of the Diamond Fields, hundreds of carts and wagons were sent away every month to Kimberley, the Transvaal, and Free State. Of late years the industry has considerably declined, partly owing to the railway

having in many districts superseded the primitive mode of conveyance, and partly to the diminution of trade. Large numbers of the unique Cape cart, with fixed or folding hood, are, however, still manufactured. For strength, endurance, and comfort in travelling they are unequalled by any American imitations which have endeavoured to compete with them. Wagons are usually built in the hottest part of the year, and are thus able to withstand the severest droughts.

At the Edinburgh Forestry Exhibition, it was ascertained that several Colonial hard woods might be advantageously used for engraving purposes. Specimens* were therefore prepared (cross sections, one inch thick), and forwarded to Messrs. C. and A. Young, engravers on wood, Ludgate Circus, and their report is as follows:—

Kamassi (*Gonioma Kamassi*). Suitable for the finest mechanical engraving, such as machinery of all descriptions; also adapted for ordinary engraving purposes.

Quar (*Euclea undulata*). Nearly equal Kamassi, and quite suitable for ordinary engraving.

Redwood (*Ochna arborea*). Very suitable for ordinary engraving, also most excellent for wood type.

Salie Wood (*Buddleia salviæfolia*). Quite suitable for the bolder kinds of engraving, also excellent for wood type.

Saffraan (*Elæodendron croceum*). Excellent for the large size of wood type, posters, and bold engraving generally.

White Pear (*Pterocelastrus rostratus*). A good useful wood for all the larger kinds of engraving, wood type, posters, &c.

With the exception of Saffraan, the trees mentioned in this list are under two feet in diameter. Some of them rarely exceed twelve inches in diameter, and are at the present time sold at the rate of one penny per running foot as poles. As their small size would probably not militate against their usefulness for engraving purposes, and for the manufacture of mechanical appliances, such as weaver's shuttles, skate-rollers, &c., it is expected that further trials will lead to an export trade in these valuable woods to meet the demand for the ever diminishing supply of true box-wood.

No estimate of the quantity of these woods is at present available, as all trees under twelve inches in diameter, when marked for sale, have been indiscriminately described as "poles." The number is, however, considerable, and arrangements are in progress for the enumeration of each species.

* Specimens were not tested of Cape Box (Gala-gala), probably a more valuable wood than any of those submitted. Its qualities will be mentioned in connexion with the Eastern forests of the Colony.

The principal timber trees in the Eastern forests are :—

Common Name.	Botanical Name.
Sneezewood	Pteroxylon utile.
Upright Yellowwood	Podocarpus latifolius.
Bastard do.	Do. pruinosus.
Outeniqua do.	Do. elongatus.
White Ironwood	Vepris lanceolata.
Black do.	Olea laurifolia.
Red Els	Cunonia Capensis.
Red Pear	Scalopia Ecklonii.
White Pear	Pterocelastrus rostratus.
Hard Pear	Olinea Capensis.
Thorn Pear	Scolopia Zeyheri.
Kafir Plum	Harpephyllum Caffrum.
Boerbone	Schotia latifolia.
Kamdeboo Stinkwood	Celtis rhamnifolia.
Saffronwood	Elœdendron croceum.
Essenwood (Cape Ash)	Eckebergia Capensis.
Wild Olive..	Olea verrucosa.
Knobwood	Xanthoxylon Capense.
White Milkwood	Sideroxylon inerme.
Cape Plane..	Ochna arborea.
Beukenwood	Myrsine melanopleos.
Red Milkwood	
Wild Lemon	Grumilia cymosa (?)
Assegai	Curtisia faginea.
Paardepis, or Foul Leafwood ..	Hippobromus alata.
Cape Box (Gala-gala)	Undetermined.
Black Bark or Swart Bast ..	Royena lucida.
Guarri	Euclea lanceolata.
Red Currant	Euclea sp.
Wild Chestnut	Calodendron Capense.
Natal Mahogany, Blinkbar, or Wild Peach	
Red Stinkwood or Bitter Almond	Brabejum stellatifolium ?
Septee	Halleria elliptica.
Kajatenhout, or Cape Teak ..	Atherstonea decussata.

The forests in the East of the Colony are somewhat larger than the Knysna forests, but less compact and less well known. They are naturally classified into mountain forests and coast forests. The bulk of the mountain forests lies North of King William's Town, on the slopes of the two parallel ranges of the Perie and Amatola Mountains. In addition there are detached portions of

forest commonages, and the total area of the Eastern mountain forests is 152 square miles.

The licences charged by Government for felling in the Eastern forests are considerably higher than at Knysna. Thus Upright Yellowwood, which costs 3d. per cubic foot at Knysna, is charged at the rate of 7d. in the King William's Town divisions. Nor has the old system of selling by load been altogether dispensed with in some districts. An entire revision of the King William's Town tariff is considered necessary, both for the well being of the forests and the true interests of consumers.

As at Knysna about fifty per cent. of the timber is Yellowwood. In the Amatolas both species, Upright and Outeniqua, abound; some of the largest in the Colony are found in the King William's Town forests. The "Eastern Monarch" (Outeniqua) has a girth of thirty feet, a clean bole of 40 feet, and a total height of 90 feet. The most important tree is, however, Sneezewood (*Pteroxylon utile*). On the Amatolas it is probably on the verge of its habitat in the west, whilst eastward it flourishes at intervals as far as Natal, where it is said to grow better than in this Colony. Within the Colony Sneezewood and Stinkwood (*Oreodaphne bullata*) are never found growing together. The Knysna forests possess no Sneezewood and the Amatolas no Stinkwood, with the exception of a few small specimens which may be regarded as botanical curiosities. In the forests of the Transkeian territories both are found growing side by side. This is somewhat remarkable, and would appear to denote a blending of the climatic conditions prevailing in the more western regions, favourable to both species.

Sneezewood is one of the most valuable woods in South Africa. In point of durability it ranks with Greenheart, Jarrah, and Camphor. On the Port Elizabeth breakwater, where the attacks of the sea worm (*teredo navalis*) are exceptionally virulent, it has successfully withstood the test of partial immersion for upwards of twenty years. The heartwood of Sneezewood is regarded as imperishable for fencing posts. It is not attacked by the white ant, and posts put in by the earliest colonists are sound to the present day. Unfortunately the supply of large wood is now very limited. Its extirpation was imminent when the forests were taken over for management, and felling is now prohibited in Government reserves. Natural regrowth is everywhere abundant, and with careful conservation much may be done towards the restoration of Sneezewood to the economic uses it is so eminently suited to fulfil.

The Coast Forests lie either directly along the sea shore or in the valleys of the larger rivers as they approach the coast. They have no pretension to the grandeur of the Amatola forests, and in many

places, notably in the neighbourhood of Alexandria and Bathurst, have been reduced to mere scrub. They are chiefly valuable for the Sneezewood and Boxwood* they contain. Only during the past year has the value of the latter wood been brought to notice, and Boxwood now bids fair to take its place as by far the most valuable wood in South Africa. The Box-producing country is unfortunately limited at present to the south-east corner of the Colony in the neighbourhood of East London. The total area probably does not exceed fifteen or sixteen square miles, half of which is in the hands of private proprietors. Until quite recently this valuable product has been sold as firewood at *five shillings* a load on the East London market.

The average diameter of Boxwood rarely exceeds a foot, and its length of bole twenty feet. An approximate calculation has been made of the Boxwood contained in the Crown forests of Fort Pato and Fort Grey, 7,000 and 12,000 acres in extent respectively. It is estimated that together they contain 361,400 cubic feet of serviceable wood of different sizes, besides an ample natural re-growth of young trees. Assuming 35 cubic feet to weigh a ton, by which weight the wood is sold, the stock in these forests may be considered roughly 10,000 tons, and, at a price of £20 per ton in the rough log, should be worth £200,000 on the English market. Or if, in order to maintain a continued supply and to keep up natural reproduction, one-fortieth part of the stock be annually felled, a revenue of £5,000 per annum should be derived by the Colony from these two small forests alone. The total area producing Boxwood should yield more than double that amount.

Kamassi wood, which, as previously mentioned, grows abundantly at Knysna, is in many respects similar, and by some declared superior to the Boxwood of East London. Together it is hoped these woods may in some measure meet the decreasing supply of hardwoods referred to above.

The Conservator of King William's Town is assisted by a staff of six European foresters and four native forest guards. Each forester is stationed in the forest of which he has charge, and besides the ordinary police and inspection duties required of him as well as of similar officers at the Knysna, he is entrusted with the management of a nursery, two or more acres in extent, adjoining his cottage. Each forester is expected to raise 40,000 young trees during the year for planting out on bare patches it is desirable to re-forest.

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* The genus of this tree has not been determined by Cape Botanists. It has many characteristics of *Buxaceae*, a genus not hitherto recognised at the Cape. Species of true *Buxus* are found in Madagascar and in tropical Africa, and this may prove to be a new species.

The Western Divisions of Cape Colony contain little forest of any kind. There are, however, large areas of Crown Land which furnish firewood and grazing, and these are under the immediate supervision of a Conservator and staff of rangers. The most important work in this Division is in connection with Plantations, which have been begun on an extensive scale.

In the District of Swellendam there exists a small area of indigenous woodland about 900 acres in extent, and though nominally under the control of the Forest Department, it is unsurveyed, and no measures have as yet been taken for its systematic management. The species contained in this forest are similar to those of Knysna, and the wood is considered equally serviceable for wagon making and kindred industries.

The most noteworthy indigenous tree now found in the Western Division is the Berg Cypress or Cedar (*Widdringtonia juniperoides*), which grows in the mountains of Clanwilliam. In former times the whole of the Cedar Berg range was studded with these trees, but conflagrations and the unrestrained use of the axe have well nigh decimated these valuable forests. All the internal woodwork of the church at Clanwilliam and of numerous homesteads is of Cedar from the neighbouring mountains. Sir John Alexander reports that in 1836 a tree was cut down measuring 36 feet in girth, and furnishing 1,000 feet of planking. In quality the wood is said to be equal to the Scriptural Cedar of Lebanon. The specimens remaining are of small growth and scattered over an area of about thirty miles amongst the abrupt mountain crags and kloofs of the Cedar Bergen, snow-capped in winter.

The reproduction of this tree from seed has been successfully accomplished in the Government nurseries to be subsequently spoken of.

With the exception of *Pinus insignis* so successfully introduced at Graham's Town, the only pines thoroughly acclimatised in the Cape Colony are *Pinus pinaster* (*Pin maritime* of France) and *Pinus pinea* (Stone Pine of Italy), and nowhere do they flourish so well as on the Cape Peninsula. The Pine woods stretching along the fertile strip of country on the south-east slopes of Table Mountain constitute a remarkable feature in the landscape. Both species reproduce themselves with the greatest facility, and under old trees in favoured localities, young Pines come up like grass. Cape Town and its suburbs are supplied with firewood from these plantations, and the wood, though excellent in quality, is rarely applied to other uses.

The Blue Gum (*Eucalyptus globulus*) was first introduced into Cape Colony in 1828. Plants from Australian seed were raised in Mauritius by Sir Lowry Cole when Governor of that island, and on being transferred to Cape Town in the above-mentioned year

he brought a number of seedlings with him. Nine only survived the voyage, and were planted in the Governor's garden. Of these two are still standing, and consequently are about 58 years old. The largest measures 19 feet in girth at 3 feet from the ground. Its height is not more than 95 feet, further growth having been stopped, as with all trees in these gardens, by the violence of the wind.

Perhaps the most completely acclimatised forest tree is the Oak (*Quercus pedunculata*) introduced by the earliest Dutch settlers. This tree has become naturalised in all the more temperate portions of the Colony, though the climate is undoubtedly warmer than in its European habitat. It bears acorns regularly and very abundantly, and is freely reproduced from self-grown seedlings. It is easily transplanted, and but little care is ordinarily taken to ensure success. In many towns of the Western Province the streets are planted with oaks. At Stellenbosch and Paarl they have attained very large dimensions, and the cool shade afforded by their giant arms is the delight of the villagers and a lasting monument of the enterprise and forethought of Governor van der Stell, who planted them. Cape Town also has its leafy avenue of oaks which, planted 200 years ago, had fallen somewhat into decay. Its restoration has been undertaken by the Forest Department, and a sum of £400 has already been expended on pruning and re-planting.

The fixation of the ever-shifting belt of sand constituting the isthmus between False and Table Bays, for many years occupied the attention of Government, and the importance of the work was augmented by the construction of the main railway line from Cape Town across the sand at its most unsettled point. The sand supply is derived from False Bay, and blown inshore by the strong south-east gales prevailing in summer.

Previous to 1877, rows of bush screens were erected across the wind, and seeds sown between them. This method was wholly unsuccessful. The screens were blown down, the seeds hopelessly buried, and the sands continued their way without interruption. In the above mentioned year, at the instigation of Mr. Lister, the present Conservator of the Western Forest Division, a railway siding was constructed from D'Urban Road station, nine miles from Cape Town, right into the heart of the drifts, and along this the street refuse of Cape Town was deposited daily. In this manner about 1,500 tons of manure were supplied monthly for about five years, a great portion of which has been carted away and spread over the sand hills. In the drifts thus temporarily arrested, a mixture of seed was sown composed of Pyp Grass (*Ehrhartia gigantea*), Australian Black Wattle (*Acacia Saligna*), *Hakea Suaveolens*, and two varieties of Pine (*P. Pinaster* and *P.*

Pinea). The success of this method has been complete, and the sandy wastes in the vicinity of the railway, in area about four miles, are now clothed with a luxuriant growth of grass and trees with an almost park-like appearance. Pyp grass grows readily and quickly, fixing the sand until such time as the more effective trees spring up. The more difficult portions have cost about £6 per acre to reclaim, but the average of the entire area does not exceed £2 per acre. A return equal to the interest on the money thus invested may now safely be drawn from the plantation.

The Pines have not been altogether successful, but the Black Wattle (*A. Saligna*) could not apparently have found a more congenial home. The trees first planted are now eight years old, and where special care has been given to their cultivation, some measure five feet in girth at one foot from the ground, where the branches bi-furcate. Self-sown seedlings spread rapidly, and in a few years the entire area will doubtless be covered with this valuable wood, and a handsome revenue may be looked for. The bark is highly esteemed by tanners, who pay for it £7 10s. per ton, dry, and for fuel the wood is far superior to the fir, now almost universally consumed. The percentage of tannin yielded by this Wattle has not been definitely ascertained in the Colony, but it is supposed to be not inferior to the Australian yield, viz., 30 per cent. The entire isthmus between Table Bay and False Bay appears to be admirably adapted for the cultivation of Australian tannin-producing Acacias. Special prizes are offered by Government for the cultivation of these sandy flats, and private enterprise is now being directed, though somewhat languidly, to meet an increasing want of tanning material. *Acacia Glaucophylla* is also extensively grown, and *A. melanoxylon* has been very successfully introduced. The latter variety has, however, been almost entirely eradicated, and its planting discouraged, owing to its ready attack by the Dorthesia or Australian Bug.*

PLANTATIONS.

In 1876 a stimulus was given to tree-cultivation by the passing of an Act, whereby public bodies were aided by Government to the extent of one-half their expenditure on such work, and £1,000 is annually voted for the purpose. In the same year an experimental fuel plantation, principally Blue Gum, was commenced by Government at Worcester, about 100 miles from Cape Town. The area of this plantation is 80 acres, and it contains about 40,000 well grown poles; many of them, now ten years old,

*To the ravages of this pest the Colony is indebted for the loss of many of her finest orange groves in the neighbourhood of Wellington, Stellenbosch, and Piquetberg. The Dorthesia has been described in the United States, where it also destroys orange trees, as *Icerya Purchasi*. According to the reports of Professor McCoy, of the Melbourne Museum, it is undoubtedly a native of Victoria, Australia.

are five feet six inches in girth, and all nearly 100 feet high. The annual increment is calculated to be eleven tons of dry wood per acre.

A similar plantation, eight acres in extent, was commenced, and is now flourishing, at Beaufort West, but the scarcity of water, and the brak (saline) nature of the soil rendered the work too costly to be continued.

The success of the Worcester plantation has lead to the formation of nurseries and plantations at Tokai, on the Table Mountain range near Constantia, and at Ceres Road. At Tokai plants have been raised of about 150 species of extra-tropical trees, of which the seeds have been imported from all the warm-temperate countries of the world. There are 33 varieties of Eucalypts, and about 20 varieties of Pines. The Oak *(Q. pedunculata)*, and Camphor Tree, acclimatised for upwards of 200 years, are extensively propagated. Nearly a million tree-plants are now flourishing in these nurseries. It is proposed to re-forest the whole of Table Mountain, and in two seasons nearly 1,000 acres have been planted.

At Ceres Road an area of about 3,000 acres bordering the railway is in process of re-foresting. In one season 500 acres have been planted with 105,000 trees, comprising 75 species.—Special attention is given to the cultivation of Jarrah (*E. marginata*), and Camphor Tree, which are expected to prove most useful in railway works.

DISTRIBUTION OF PLANTS AND SEEDS.

This is an important function of the Forest Department in the Western Division. In four years, 1882-85, fully a quarter of a million plants have been distributed throughout the colony from the Worcester nurseries, at an almost nominal rate; and in two seasons Tokai has supplied the public with 140,000 plants.

Of seeds, 19,000 pounds weight have been disposed of in four years, consisting principally of *Pinus pinea*, *P. pinaster*, and *Acacia saligna*. A large proportion is supplied gratis to perpetual leaseholders of certain Crown lands.

With such machinery at work, and with a growing appreciation of the utility of tree-planting and forest conservation, it is confidently hoped that the efforts of Government in this direction, will, in future years, render the colony independent of foreign markets for her timber supply.

THE CAPE AS A HEALTH RESORT.

The Cape Peninsula.

By C. Lawrence Herman, M.B.; M.C.; M.R.C.S.

Though the Cape climate has already for a long time enjoyed a reputation for its salubrity, and many travellers have been warm in their praises of its health-giving properties, it is incomprehensible that so little is known in Europe of its advantages as a resort for invalids, "even by our best physicians."*

The South African Medical Association, with a view to placing on record some definite and reliable information on the subject, appointed a committee, with the sanction of the Colonial Government, to collect and collate information dealing with this important subject. Circulars were sent to medical men all over the Colony asking for assistance, and a large number of replies were elicited, containing most valuable information.

The space allotted in the Handbook to this subject unfortunately renders it impossible to do more than give a few extracts from some of these replies. It will be sufficient, however, to say that they were of a uniformly favourable character, and establish incontestably the beneficial effects of this climate on invalids suffering from chest affections.

The appended reports, necessarily very brief, written by gentlemen who have a practical knowledge of the districts they describe, and using the information obtained in reply to the committee's circular, may serve as a guide to the most important areas into which, for purposes of description, it has been found necessary to divide the Colony.

It must be remembered that over so extensive an area, presenting such varied physical features, high mountains, low-lying valleys, elevated table lands interpersed by patches of desert here and there, the climate must needs vary very considerably in different parts, and it is necessary therefore carefully to examine the meteorological circumstances of each area before recommending invalids to take up their residence in any particular locality.

The seasons here are not so well marked as in Europe. Spring merges into summer, and there is little change between autumn and winter. Christmas time sees us at the Cape in nearly midsummer. Spring is a most delightful season, when glad nature

* Dr. Harry Leech, Notes on South Africa for Invalids.

rejoices, and the earth is covered with the greenest verdure, crop after crop of the most beautiful flowers succeed each other, covering the veldt on every side, as far as the eye can reach with a red, white, or yellow carpet.

The heat is nowhere excessive, and though the direct rays of the sun, particularly in summer, may be very great, yet the peculiar dryness and rarefaction of the atmosphere render it easily bearable. In some of the deep-lying valleys where the motionless air becomes heated by the large mountain masses, the heat is in summer oppressive, but the actual heat is at no time excessive. Taking as an example Kimberley, notably one of the warmest places in the Colony, we find the absolute maximum temperature during 1882:—

For January	105·5	For July	75·6
February	101·3	August	85·0
March	94·2	September	92·7
April	91·5	October	96·0
May	79·1	November	97·5
June	75·0	December	101·0

Yet there is no place in the Colony whose people have more ceaseless activity, or more restless energy. Europeans work here all day, heedless of the heat. The day is characterised by a maximum of sunlight, a balmy, buoyant atmosphere with a clear cloudless sky of the purest blue, and a cool night succeeds a warm day.

In former years, before the opening of the Suez Canal, the Cape was the favoured resort for invalids from India. It was the winter season that evoked their enthusiasm. Dr. Stovell, writing in the Bombay Medical Journal, says: "No climate in the world could be more agreeable to the feelings—and very few more beneficial for the usual class of Indian invalids than a Cape winter. There is an invigorating freshness about this season equally delightful and beneficial; the moment the rain ceases, the clouds rapidly clear away and the sky remains bright for several days."

The total mean annual temperature is 61·26 F. in the shade, a remarkable approach to the mean annual temperature of England, 62°, and when to this fact is added the peculiar characteristics of the Cape climate, the excessive dryness, clearness, and rarefaction of the atmosphere, with a maximum of sunlight, a series of conditions of an almost typical character are met with for the treatment of pulmonary affections.

The peculiar dryness of our climate, while it gives it such valuable properties for invalids suffering from pulmonary disease, is, as Dr. W. H. Ross remarks, "the cause at once of all our woes and our wants. The periodical and long-continued droughts have made

all agricultural speculations a mere matter of reliance on St. Swithin; while the gradual denudation of the soil by bush-fires, and careless cutting down of trees, has intensified the action of the sun and the desert winds. The greater part of our colonial land is glazed with baked clay, from which the water runs off as fast as it falls. There is nothing to retain moisture and allow of slow filtration, and except in the neighbourhood of the Knysna and George forests, and the few miles of territory that are moderately well wooded, there is really no certainty as to water supply."

Such being the broad characteristics of the Cape climate, it is easy to see what class of patients will be most benefited by a sojourn here. The rainy seasons vary in different parts, so that the invalid need find no difficulty in travelling from place to place to avoid the wet. In the most advanced cases, it would be best to winter on the plains and pass the summer in the cooler and more elevated mountain lands of the interior; but in less marked conditions the coast need not be left, as the late Dr. Harry Leech (Medical Officer for the port of London) remarks in his "Notes on S. Africa for invalids:"—

"I can safely say that even the air of Wynberg on the one side, and of Green and Sea Points on the other side of Cape Town, are very good atmospheres for invalids, and indeed far better than can be found at most times of the year at any so-called Sanitaria in the United Kingdom or the Continent of Europe. Even for the invalid who does not care, or is not able, to go beyond the precincts of Cape Town, a residence in the Wynberg district during the summer (Cape summer) and at Sea Point during the winter months, will avoid the disagreeable circumstances that obtain on both sides of the capital at certain seasons of the year."

The prevalent diseases are those of Europe; epidemic disease is rare. There is no ague, or yellow fever, nor has cholera ever visited our shores, and hydrophobia is unknown. Cases of chronic lung disease are infrequently met with among the European population, and acute lung disease is not attended with so much danger as in Europe; even infants a few weeks old recover from severe attacks of bronchitis which would invariably have proved fatal in Europe. The fevers are of a mild type, and are seldom followed by sequelæ. Diseases of a parasitic nature are rare, and Hydatids are infrequent. Rheumatisms and neuralgiæ are common, due to some extent, doubtless, to the large amount of meat consumed, and perhaps also to a diluted malarial influence.

Whilst all pulmonary affections are benefited by a residence in this climate, it cannot be too earnestly recommended that cases sent out here should be carefully picked; frequently invalids

suffering from pulmonary phthisis arrive here in the last stages of their complaint, and are landed only to die. To derive any real benefit they must arrive early, and to effect any lasting amelioration in their condition it is advisable for them to take up residence here for a considerable period; in fact, they must be encouraged to make this country their home.

Sufferers from bronchial and asthmatic affections derive great benefit here. Where there is any marked hereditary phthisical tendency, a residence is most strongly to be recommended, particularly in the case of children. In other conditions of debilitating and wasting disease, much benefit will be derived from travelling in our equable climate; and a convalescence from a serious illness can be most profitably spent by voyaging to the Cape, spending a short time here, and then returning.

The voyage to the Cape has justly become famed as one of the most pleasant and enjoyable it is possible to make, and the great ocean steamers of the Cape lines have become celebrated for their comfort and punctuality. Provided with every necessary and every comfort, each carrying a surgeon, they touch, either outward or homeward, at Lisbon, Madeira, St. Helena, and sometimes Ascension, and accomplish the voyage to Cape Town in somewhat less than three weeks.

Cape Town is the most convenient place for the invalid to land at; it is provided with the best means of communication with the interior. "In all the world," says Mr. Froude, in his *Oceana*, "there is no place so beautifully situated." The sanitary condition of the town itself is unfortunately not over good, though vastly improved in the last year or two. Hotels and private boarding-houses are numerous, and everything obtainable in the European towns can be got here. It is advisable, however, for the invalid suffering from distinct pulmonary disease not to tarry too long in Cape Town, but to select a locality to proceed up-country, and by rail in six, twelve, twenty-four, or thirty-six hours he can comfortably, in a Pullman car, be transported hundreds of miles at very small expense and without any discomfort.

The cost of living fluctuates very much and differs considerably in different localities, but on the whole it is not more expensive than in England. Luxuries are dear, and servants bad, but the ordinary necessaries of life are cheap and plentiful. In the western parts of the colony fruit is very plentiful. House rent is generally high, and the accommodation as a rule is not perfect. The hotels and boarding-houses are open to improvement, particularly up-country. A great stride would be made if a good sanitorium for invalids was established on European principles.

GRAHAM'S TOWN AND THE EASTERN DISTRICTS.

By the Hon. W. Guybon Atherstone, M.D., F.R.C.S., F.G.S.

This area may be said to include all that portion of the Cape Colony between the main chains of mountains and the seaboard to the eastward of the 26th parallel of longitude; the home, in fact, of the British Settlers of 1820 and their descendants. It is divided, as are the southern and western parts of the Colony, into three terraces, separated by mountain ranges running parallel to the coast.

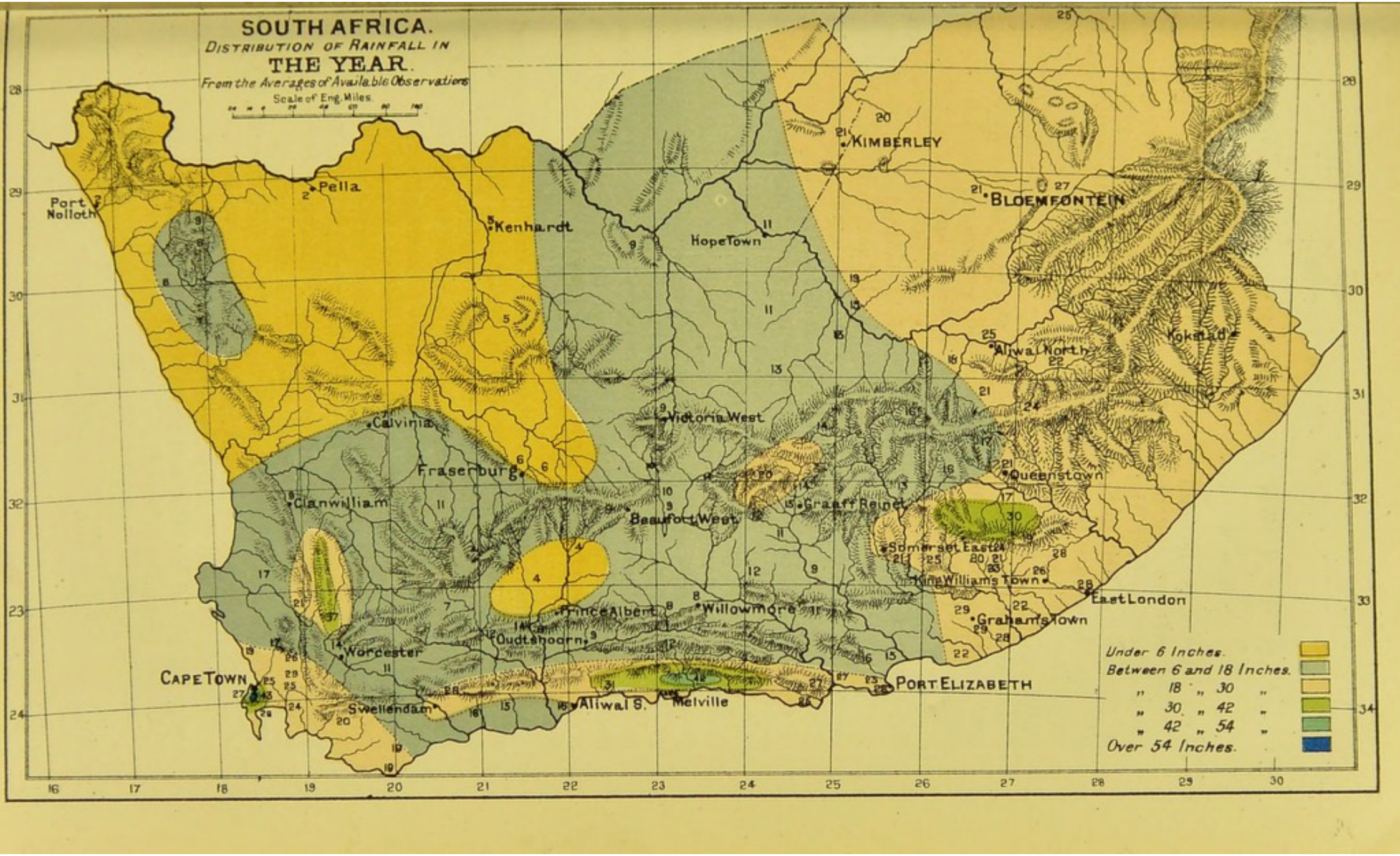
1st. A coast plateau extending to the base of the first mountain range, about 1,000 feet altitude, embracing the districts of Alexandria, Bathurst, Peddie, East London, and Komgha.

2nd. The midland terrace, between the altitudes of 1,000 and 2,500 feet, comprising Albany, Somerset, Bedford, Fort Beaufort, Victoria East, Stockenstrom, and King William's Town.

3rd. The upper plateau, from 2,500 to 5,000 feet above the sea, in which are situated the districts of Cradock, Tarkastad, Queen's Town, Stutterheim, Cathcart, Wodehouse and Aliwal North.

The climate of this important and interesting part of the Colony is as varied as the physical character of its fiscal subdivisions are diversified in altitude, soil, vegetation, geological formation, and capacity for absorbing and retaining or throwing off the rainfall, and thus affecting the moisture or dryness of the climate, and its range of temperature,—the chief meteorological factors in considering the claims of particular localities for selection as health resorts.

In these three terraces, we have thus a *coast* climate, warm and moist and equable, its winter cold moderated by the warm sea; a *midland* climate, cooler and drier and more genial, but with a greater range of temperature, due to its altitude and the greater amount of evaporation from diminished pressure, its mean range varying from 18° to 20°; and a *mountain climate* drier still, and more bracing, but with much greater extremes of temperature, cold nights and hot days, the mean range being more than double that of the lower or coast plateau. Taking Port Elizabeth, Graham's Town, and Aliwal North as representing the three types of climates, the following, taken from tables compiled by the Cape Astronomer-Royal in 1881, of four years observations, 1876 to 1879, will justify these remarks, which are also substantially borne out by later and more complete tables compiled by the Meteorological Department.


SOUTH AFRICA.
DISTRIBUTION OF RAINFALL IN
THE YEAR.
From the Averages of Available Observations
Scale of Eng. Miles.
Port Nolloth
Pella
Kenhardt
HopeTown
KIMBERLEY
BLOEMFONTEIN
Kokstad
Aliwal North
Calvinia
Victoria West
Fraserburg
Queenstown
Clanwilliam
Beaufort West
Graaff Reinet
Somerset East
King Williams Town
East London
Prince Albert
Willowmore
Graham's Town
Oudtshoorn
Worcester
CAPE TOWN
Swellendam
Aliwal S.
Melville
PORT ELIZABETH
Under 6 Inches.
Between 6 and 18 Inches.
" 18 " 30 "
" 30 " 42 "
" 42 " 54 "
Over 54 Inches.

(E) 1879. 1. Coast plateau.		Temperature. Mean temp.	Absol max.	Absol min.	Mean of max.	Mean of min.	Mean range	Humidity. Complete saturation =100.	Rain. Amount in inches.	No. of days on which rain fell.	Wind.
1. Port Elizabeth alt. 180 ft.	Summer	66·8	94·5	48·5	75·0	60·4	14·6	75	19·99	49	S.E.
	Winter	59·5	97·5	43·0	67·4	53·3	14·1	80			NE. & W.N.
2. Midland. Graham's Town alt. 1800 ft.	Summer	63·1	99·0	44·0	74·3	56·6	17·7	74	29·59	77	S.W.
	Winter	53·1	82·0	35·0	63·7	50·9	12·8	77			WSW
3. Mountain. Aliwal North ... alt. 4330 ft.	Summer	67·4	102·0	41·0	88·2	55·8	34·4	55	22·86	89	S.E.
	Winter	48·8	84·7	24·0	62·6	38·4	34·2	77			N.W.
3. Mountain. Colesberg Bridge alt. 3600 ft.	Summer	69·7	101·0	33·0	85·3	54·9	30·4	44	18·35	69	S.E.
	Winter	49·3	84·5	23·0	66·8	39·2	27·6	73			S.E.
1. Coast (W.) Wynberg... ... alt. 250 ft.	Summer	63·8	96·0	42 0	76·2	65·2	11·0	75	34·62	92	S.E.
	Winter	55·3	92·0	41·5	66·4	49·2	17·2	83			N.W.

It will be seen that Graham's Town has the *lowest* mean temperature in summer, and the smallest range in *winter*, and the largest rainfall, which occurring in summer cools the heat, and explains its low temperature. The humidity is also less than at Port Elizabeth, although the rainfall is $\frac{1}{3}$ more (nearly 30 inches to 20 inches, at the coast station;) whilst the dry winter reduces the range to 12·8, that of Port Elizabeth 14·1.

The character of the vegetation, soil, and geological formation exerts also a considerable influence on climate and health. The rank luxuriant hairy grass is generally met with in the coast lands, and on the "Zuurberg" Mountains, hence named "Zuur veldt" or "Sour grass" country. The greater part of Lower Albany, Alexandria, Bathurst, Peddie, East London and Keiskama to Fort Beaufort, is of this character. It is far less nutritive than the grass of the middle terrace which is generally "sweet grass," or alkaline bush, the rock formation being shales or conglomerate, rich in alkalies and lime. Stock from this country sent down to the coast lands often sicken and die from the change, gorging themselves on the coarse grass which requires twice the quantity to give the same amount of nutriment. A mixed herbage is met with on the mountains of the upper terraces, a luxuriant red grass, highly nutritious: and on the plains the stunted karoo shrubs, bitter and alkaline, or a mixture of both, called "gebroken veldt;" and in some parts the mimosa thorns, always an indicative of good country for stock.

The special advantages of the climate of each district for indivi-

dual cases has, of course, to be considered separately. Dr. Drew has ably set forth the claims of Alexandria; Dr. Egan those of King William's Town; Dr. Pearson, those of Seymour and the Katberg; but generally the whole of the Eastern Districts have a reputation for salubrity and almost entire absence of malarious and endemic diseases. The extraordinary increase of the descendants of the original settlers during the two-thirds of a century that have elapsed since their arrival here in 1820; the advanced age to which so many of them have attained; the tall stature, and healthy physical development of the frontier residents generally, both Dutch and English, as well as the splendid physique and healthy appearance of the native races, Kafirs and others, and their rapid rate of increase, all point to the healthy character of climate and soil.

One of the advantages of Graham's Town as a sanitarium, in addition to its elevated site, fine climate, and pure air, is, as already related, the facility with which invalids can remove by rail to a higher or lower level, to the soft warm balmy air of the coast, where no frosts are known, or the keen dry mountain air of the Katberg, Winterberg, or Stormberg. Another is, that the patient is within easy reach of the comforts and luxuries as well as the necessities of civilized life, and the pleasures of English society—advantages most important yet too often overlooked or disregarded in the choice of a suitable residence for invalids. Of what avail to the unhappy consumptive with body and mind out of gear, is a healthful climate if shut out from the world and society, and from all sources of mental and physical enjoyment. Here pleasurable occupation and amusement suited to every taste, with sufficient inducement for out-door exercise—often as essential as medical treatment or pure air in cases of lingering diseases—are readily obtainable. To the sportsman the deep wooded kloofs of the neighbourhood offer abundant excitement. Antelopes of various kinds, the rhebok, blauwbok, and boschbok, with hares, pheasants, partridges, are found close by; herds of buffaloes still haunt the tangled thickets of the Kowie bush; the duyker and oribie on the grassy flats near Bathurst, and the graceful gazelle of the Cape (the springbok), with korhaan and guinea-fowl on the plains towards Bedford and Somerset. To the angler the deep shady pools of the Kareiga, within a few miles, offer tempting attractions, and to lovers of the picturesque, those enjoyable picnic and boating excursions to the different watering places—the Kowie, Kasouga, and Kleinemont—afford in all seasons pleasing change and variety. Whilst to those of intellectual habits and literary taste, the various institutions of the city, its reading-rooms, circulating library, museum, and botanical gardens, are at all times accessible.

Invalids who have experienced the effects of both climates, assert

that there is no comparison between the clear, dry, invigorating climate of this part of the Colony, and the warm, moist, relaxing heat of Madeira, which has hitherto enjoyed the monopoly of a sanitarium for chest complaints.

During my professional life of 45 years in Graham's Town, I have known cases of consumption *far advanced* completely recover, and even phthisical cavities have cicatrised, and the progress of the disease has been entirely checked when confined to one lung. I have known also cases of hereditary consumption completely eliminated from the system by a prolonged residence in the drier inland parts of the Colony; and I can confidently state, that if the unhappy victim of hereditary consumption were to be sent out to this Colony three or four years before the expected period of attack (as shewn by the history of other members of the family), and kept here in some favourable locality until three or four years after that age, there would be every chance of the hereditary taint being entirely eliminated from the system. In most cases the patient returns home too soon after he feels himself well, and the irritative matter in the air of his native climate lights up again the dormant germs of his old complaint.

THE CENTRAL KARROO DISTRICTS.

By H. W. Saunders, M.B., Lond., F.R.C.S., Eng.

The plateau of the "Karroo" or "Great Karroo" is a vast tract of country in the Western and Midland Provinces of South Africa, lying between the Roggeveld and Nieuwveld mountains on the north, and the Zwarteberg mountains on the south, and extending from the Hantam in Calvinia District to Sunday's River in the Graaff-Reinet District, that is, over five degrees of longitude.

It includes, for the purposes of a general description, the fiscal Divisions of Tulbagh, Worcester, Prince Albert, Beaufort West, Murraysburg, Willowmore, Aberdeen, Jansenville, part of Somerset East, Cradock and Graaff-Reinet.

The approximate average level of the Karroo is about 3,000 feet above sea level. To shew the gradual rise to the north we may give the approximate heights of the chief towns, viz.:—Tulbagh, 400 feet; Worcester, 780; Ceres, 1,700; Prince Albert, 2,100; Beaufort West, 2,850; Aberdeen, 2,400; Somerset East, 2,400; Graaff-Reinet, 2,500; Murraysburg, 3,800; Cradock, 2,856. The average height of the Nieuwveld, Roggeveld and Zwartberg mountains may be taken at 5,000 feet, but some of the peaks rise over 7,000 feet.

The *climate* of the Great Karroo is characterised by its extreme

dryness, severe and prolonged droughts occurring at intervals, whilst at the best seasons rains seldom fall.

The temperature is intensely hot in summer, much more bearable, however, than an equivalent heat in a moister atmosphere, and the nights are cool, at least on the plains, away from the immediate vicinity of the mountains. The skies in summer are mostly of brass, unclouded, except by the cirrus of heat on the horizon.

Winds in summer are not infrequent, but they are mostly from the north and north-west, and having passed over or perhaps originated in the desert, are comparable to the simoon on a small scale, bringing great clouds of red dust with them, and feeling as if coming from an oven; they seldom blow long. Some places nearer the coast come under the influence of the south-east trades, such as Tulbagh, Prince Albert, Worcester, &c.

Thunderstorms are not very frequent, but are often of great violence, and often follow in the wake of the north-west winds; in a few hours vast tracts of country may be transformed into temporary lakes, and great damage is done by the bursting of dams and overflow of rivers at these times.

The winter is characterised by very cold nights and early mornings, with several hours of bright, sunny weather between 9 a.m. and 3 p.m., or thereabouts. The air is remarkably clear, bright and bracing; yet, except in the higher parts of the Karroo, a fire in the sitting room is generally a luxury rather than a necessity, although often acceptable in the evenings.

Snow generally falls on the mountains, and sometimes on the higher plains; but for the most part no snow lies in the plains of the Karroo proper—Beaufort, and especially Murraysburg and Cradock, being exceptions.

The winter of the Karroo is, in the writer's opinion, the best season for pulmonary invalids; but, unfortunately, it is just the time at which none such arrive, coinciding as it does with the European summer. Of this more will be said hereafter.

Taken as a whole, the air of the Karroo may be considered to present some, at least, of the features of mountain air, of which, according to Dr. Weber, the main physical features should be :—

1. Purity; comparative absence of floating matter.
2. Dryness of air and soil.
3. Coolness or coldness of air temperature and great warmth of sun temperature.
4. Rarefaction.
5. Intensity of light.
6. Stillness of air in winter.
7. A large amount of ozone.

In winter all these features are present in greater or less per-

fection, but in summer the great heat, the prevalence of winds, often dust-bearing and very hot, and other drawbacks, often lead to lassitude and loss of appetite; there is further the impossibility, except in the robust, of taking the amount of exercise and out-door life demanded by the disease; further, the inadequate ventilation found in most of the houses renders in-door life unhealthy.

The most feasible escape from these drawbacks is, in my opinion, to get to the mountain heights in the summer; up to the present time this has not been practicable from the want of any accommodation for invalids, but steps are being taken to supply this want.

For instance, Dr. Davey, of Beaufort West, is now recommending in the *Lancet*, a comfortable home with a Scotch family on the "Nieuwveld Mountains." The summit of the pass now in course of construction over the Zwartberg Mountains, from Prince Albert, is also highly recommended by my friend, Dr. Mearns, of that village, having the advantages of ozone-laden winds in summer from the sea, a plentiful supply of pure mountain water from a beautiful stream at hand, and a view over the fertile district of Oudtshoorn; hence also a short excursion leads one to the beautiful stalactite caves of the Cango. If sufficient encouragement could be given, no doubt properly constructed institutions could be established under medical supervision at these and other favourable spots, and the Karroo would then offer the invalid an all-the-year round residence which would compare with advantage with that in any part of the world—the summer to be spent in the mountains, the winter on the plains—thus fulfilling the indications now greatly and wisely insisted upon, namely, an uninterrupted residence in and about the same locality.

Nothing has astonished the writer more than the hap-hazard manner in which consumptive patients are bundled off to South Africa without regard to the phase of the disease, peculiarities of temperament, or the appropriateness of the climate; and the ignorance displayed of the varieties of climate in South Africa would be laughable, if its consequences were not often so sad. Probably within the bounds of the Colony we possess climates more varied than can be found in any equivalent area in Europe, and yet the formula suffices, "go to the Cape." The wet season on the south and south-western coast, for example, is the winter; on the eastern seaboard it is the summer.

Too often invalids act at their own or friends' instigation, having an instinctive preference for a warm climate, or attracted by the reputation of "the Cape;" but still more frequently the medical attendant or even the consulting physician is equally careless or ignorant in this respect, and either sends incurable and unsuitable cases to die far away from friends and the comforts of

home, or having selected an appropriate case sends the patient, without any precise instructions, to take his chance.

Even Dr. Weber in his recent Croonian Lectures has fallen into error about South Africa. He advises patients to travel up-country by ox-wagon from Wynberg or Grahamstown. Considerable astonishment would be caused by this method of travelling in a country, all, or nearly all, the chief towns of which are now either on or near lines of railway, and even Bloemfontein is little more than a day's journey from the present terminus at Kimberley.

No doubt the opportunities of acquiring precise information regarding these points are extremely meagre; neither the countless popular books of travel, nor even the writings of the late Dr. Harry Leach and others, are to be relied upon as accurate, and it was the intention of the medical profession here to compile a medical handbook for the Cape (with full particulars of each district and village) for the Indian and Colonial Exhibition, but it was found that the time allotted was too short; but this is a desideratum we may shortly hope to see supplied.

As Dr. Weber says, the influence of long standing routine mostly guides the practitioner when he selects the most appropriate climate for consumption, the idea of this being ultimately associated as regards treatment with that of warm climates. The formula is "choose the warmest climate accessible," and so one locality is chosen above another on account of an insignificant difference in the mean heat of the year or season. These premises, that cold favours the formation and development of tubercle and that heat deters them, rest upon no proof, and a reaction has set in in some quarters, resulting in an opposite theory, viz., that *cold* climates should be exclusively employed. These extremes have produced as a resultant the theory of *altitude* as the great preventative and curative of phthisis.

Dr. Jaccond's writing on this subject is diffuse and somewhat difficult to follow, but his argument condensed is to this effect:—"That, seeing that alike in very hot and very cold climates phthisis is very prevalent, whilst there are numerous elevated places in the Andes, Switzerland, Silesia, &c., where at a certain altitude consumption is almost unknown, one is inclined to favour the altitude theory. This altitude varies for different places according to conditions of temperature. The altitude which preserves at one region will not do so at another, which at the same height has a warmer temperature."

If this theory be applied to the Karroo, it is doubtful whether on account of the latitude, any altitude obtainable on the plains, comes up to the standard of requirement, and it is pretty certain that there is no region in which *absolute* immunity from phthisis amongst the native born inhabitants can be claimed. Nevertheless

the writer knows from the experience of a three years' residence, and from communications from various medical men in these districts, that phthisis, especially tubercular phthisis, is almost unknown in many parts.

The study of the whole question shows decisively the healthful influence of life in the open air; so that with an agricultural or pastoral people, the lower limit of protection descends, and *vice versa* sedentary occupations cause it to ascend. It might be inferred that the protection conferred by altitude is illusory, and that the result depends upon mode of life—yet this would be a complete error, since the most favourable mode of life, that of an agricultural population, is powerless against the effects of low altitudes.

The climatic conditions which are associated in South Africa with an altitude which confers immunity from phthisis, are chiefly a temperature cold in winter and cool in summer, the winds having a special direction at fixed times during summer, and scarcely existing in winter, and a complete pureness of air. These conditions, plus a high altitude, give us the type of climates which are tonic and stimulant, *i.e.*, curative. I believe they may be found at several places in the manner already hinted at, viz., a residence on the summit of the mountain ranges in summer and on the plains in winter, if the cold be found too severe in the higher altitude.

The forms of consumption in which altitude climates are advisable are thus summed up by Dr. Hermann Weber:—

1. Hereditary and acquired tendency to phthisis.
2. The so-called "phthisical habitus."
3. All conditions comprised by the term "phthisis," excepting cases which are described as *non-suitable, e.g.*:—

(*a*) Patients of the irritable constitution at any stage of the disease. (*b*) Very advanced phthisis. (*c*) Phthisis complicated by emphysema. (*d*) Phthisis complicated by albuminuria. (*e*) Phthisis complicated by disease of the heart. (*f*) Phthisis complicated with ulceration of the larynx. (*g*) Phthisis complicated with rapid progress and constant fever. (*h*) Phthisis complicated with great loss of weight. (*i*) Phthisis complicated with considerable empyema. (*j*) Phthisis in persons who cannot sleep or eat at high stations, or feel the cold too severely.

A tendency to *Hæmoptysis* was formerly regarded as forbidding mountain climates, but this is now regarded as an error; it is said, in fact, that it occurs less frequently in these high regions; nevertheless, in such cases, considering the remarkable call made upon the circulatory and pulmonary systems by a sudden change to a highly rarefied atmosphere, it would, I think, be better, as a matter

of prudence, when there is a great tendency to Hæmoptysis, to make the upward journey by easy stages.

Probably in theory the open air, tent and waggon life recommended by Livingstone for the Kalihari region, would be the most perfect, but it is seldom practicable, except for the most robust; it would be too hot in summer, too cold in winter, besides being unfitted in other ways.

On the whole, however, the Karroo climate is favourable to out-door life. In summer the whole day can be passed in a well shaded verandah, or in a hammock slung between trees, and in winter the calm, dry, cold air is inviting to exercise, and the summer evenings, if the patient be prudently clothed, can be utilized for exercise.

Unfortunately the house accommodation, from an invalid's point of view, leaves much to be desired. The common plan of keeping the house cool is to shut it up all day long in summer, opening the doors and windows only in the early morning; the result is good, as far as coolness is concerned, but an atmosphere is produced thereby which lacks the constant interchange of fresh and foul air demanded by conditions of health, and still more by those of disease. The houses are also as a rule badly ventilated and ill-constructed, comfort being sacrificed to economy, building being excessively dear.

There is a great lack of shady walks, also, on account of the absence of woods. In some villages the streets are well planted, notably Worcester, Beaufort West, and Graaff-Reinet.

The farm houses are for the most part situated on the open plains, and have a few trees planted in the vicinity, and frequently productive vegetable and fruit gardens and orchards.

Food is on the whole cheap and wholesome, but lacks variety, and the cooking leaves much to be desired for invalids; the supply of milk, fresh butter and eggs varies very much according to the locality and the season; "always a feast or a famine" is almost a South African proverb. Vegetables are well supplied at some places and very scanty at others; a fact dependent more upon the abundance or otherwise of the water supply than upon difference of local industry.

Most of the villages contain several hotels, at which the charges are moderate, about £7 10s. to £10 per month for board and lodging, and boarding houses somewhat lower; and lodgings with private families can generally be negotiated. A fair house can often be obtained for from £3 to £6 per month unfurnished.

Illustrative cases.—The nature and scope of the Handbook forbid the insertion of cases reported in extenso, but a few jottings from various sources may not be uninteresting, as illustrating the remarks already made.

Dr. Zahn, of Ceres, reports that the death rate for lung and pleura diseases in the district, with an European population of 2,000, is as follows:—Between 1872 and 1884, five cases of chronic and six of acute lung disease (exclusive of children and of those who have emigrated with diseased lungs). In the case of coloured natives, Dr. Zahn is unable to make a satisfactory statement, as they do not as a rule fall under his notice, but he believes lung disease to be rather prevalent among them, due to poverty, intemperance and bad hygienic surroundings.

Since 1872 only one case of mileory tubercle in a youth of eighteen.

Many invalids suffering from phthisis have visited Ceres, and have as a rule been benefited, but Dr. Zahn is unable to report a single instance of complete recovery, usually he believes because the stay was too short or the disease already far advanced.

Dr. Hurford, of Ceres, reports that many cases of pulmonary disease have been greatly benefited by a sojourn there.

Dr. Davey, of Beaufort West, reports that many cases of advanced phthisis have come to Beaufort, with often the result of a certain improvement at first, but, with the exception of a very few, this was temporary only; the comforts of home and the presence of friends and relatives are much missed, and their want helps to make matters unsatisfactory. It is far otherwise in the earlier stages of phthisis: here a residence in these parts often works wonders, especially if patients are in fairly comfortable circumstances.

Dr. Mearns, of Prince Albert, reports that during a residence of more than seven years he has remarked a special immunity from pulmonary consumption and asthma. The place is not much resorted to by invalids because the virtues of the climate have never been made known, and perhaps also because there is no first-class accommodation for invalids.

Dr. M. reports the following cases among others:—

1. G.R., aged 19, came in 1879 with marked dulness at both apices; on left, breaking down of tissue, muco-purulent, frequently sanguineous expectoration, night sweats, emaciation, bad appetite. After four months he left with marked improvement in all symptoms, the disease of left apex stationary.

2. W.C., aged 42, came in January, 1882, advised by his medical men that he had not six months to live. Cavities in both lungs, great emaciation, night sweats, purulent expectoration, with frequent hæmorrhages, loss of appetite, and in short he appeared to be sinking rapidly. Improvement was steady and marked; he gained weight, appetite returned, night sweats almost ceased, and one cavity appeared to have closed; he continued to improve until 1883, when he got chilled in returning from Cape Town, pleurisy supervened and it was long ere he regained strength. He continued moderately well, taking

a good amount of exercise, till 1884, when he again visited Cape Town and contracted pneumonia, from which he died a few days after his return.

3. L.A., aged 24, has spent three winters here. He came with catarrh at both apices, which disappeared after a time but reappeared after returning home (in a neighbouring district) on two occasions; the last time she stayed some months and her medical adviser told me that she remains, fifteen months later, strong and well.

4. H.N., aged 18, with bad family history, had dulness at left apex and harsh breathing at the right, troublesome cough, night sweats and loss of flesh. He remained here six months, during which time above symptoms quite disappeared, and two years later when seen again he was well and chest quite healthy.

5. P.T., aged 35, bad family history, was given up about ten years ago as an incurable consumptive. There is no reliable account of the state of his lungs then, but now they show evidence of old pleuritic adhesions and consolidation. He is not robust but strong enough to follow the avocation of a sheep farmer, and his is a case which the climate of the Karroo has very much benefited.

No reports have unfortunately been received from Cradock, Graaff-Reinet, or Somerset East; the first named town has a high reputation as a place of resort for pulmonary invalids.

The writer is acquainted with a number of cases of phthisis which have very greatly benefited by the climate of the Karoo, and in two cases where a sojourn of a couple of years has been made a complete cure has resulted; these cases were both in an early stage. He knows of one case of "fibroid phthisis with dilated bronchi," where the sufferer for many years has had all the appearance of a hale old man, and the disease is almost always in abeyance.

He has sent cases of bronchial catarrh of an inveterate kind from Cape Town to the Karroo, with the invariable result of cure within a very short time.

Cases of asthma, unless complicated with excessive emphysema, are nearly always benefited, and the disease kept in abeyance.

ITINERARY.—A few words regarding the accessibility of the various towns mentioned may be useful. They may be thus epitomised :—

1. *On a Line of Railway* :—

1. *Worcester*, 109 miles from Cape Town. 2. *Beaufort West*, 339 miles from Cape Town. 3. *Cradock*, 181 miles from Port Elizabeth; 658 miles from Cape Town. 4. *Graaff-Reinet*, 185 miles from Port Elizabeth.

2. *Off a Line of Railway* :—

1. *Tulbagh*, from Tulbagh Road Station a few miles by cart (76 miles from Cape Town). 2. *Ceres*, 10 miles from

Ceres Road Station, which is 85 miles from Cape Town. 3. *Prince Albert*, 30 miles by passenger cart from Prince Albert Road Station, which is 265 miles from Cape Town. 4. *Murraysburg*, about 50 miles from Nelspoort Station, 371 miles from Cape Town. 5. *Somerset East*, 16 miles from Cookhouse Station, which is 126 miles from Port Elizabeth. 6. *Jansenville*, 18 miles from Mount Stewart Station, which is 113 miles from Port Elizabeth. 7. *Aberdeen*, about 30 miles from Aberdeen Road Station, which is 145 miles from Port Elizabeth. 8. *Willowmore*, 73 miles from Baroe Station, which is 103 miles from Port Elizabeth.

THE UPPER KARROO PLATEAU.

By J. Baird, M.D., L.R.C.S., L.R.C.P., Ed.

The immense tract of country included under this area embraces the Upper Karroo plateau sloping from the midland mountain ranges to the valley of the Orange River. It includes the fiscal divisions of Aliwal North, Albert, Colesberg, Middelburg, Hanover, Hopetown, Herbert, Kimberley, Richmond, Victoria West, Fraserburg, Carnarvon, Calvinia, and part of Namaqualand. This plateau varies in height from 2,700 to 6,000 feet above sea level, one point, the Compassberg, 7,800 feet, being the highest point in the Cape Colony.

To medical men and invalids the great and characteristic feature of this elevated plateau is the nature of its climate and its suitability as a residence in certain diseases of the lungs. The following remarks are intended to shew this, as far as can be done by words.

There cannot be said to exist any well marked division of the year into Spring, Summer, Autumn and Winter; rather it may be described as a long summer and a long winter. The former begins rather suddenly about the month of September, increases in intensity till January, and then decreasing till the end of April, while the latter may be said to last from the end of April till the month of September. During the first half of the summer months a westerly or north-westerly wind prevails during the day which is very warm and dry; it often blows with great force, bringing with it clouds of red sand. Towards evening the wind abates, and is followed by a steady, cool and refreshing breeze from the south-east during the night, which quite invigorates and braces after the hot winds of the day. Towards the end of December or the beginning of January thunderstorms are common, accompanied by a great downfall of rain, often with hail showers. These storms are of short duration, and their effect is such as to infuse new life into every living thing. With the exception of these

thunderstorms, it may be said that for the whole summer life is led under a cloudless sky. The heat in summer, although great—and on some days the thermometer ranges as high as 110° F. in the shade—cannot be described as oppressive, except it be shortly before a thunderstorm when the sky is overcast. This is owing to the excessive dryness of the air and to a gentle current of wind which almost always blows. But even with the very hottest days a cool night can almost invariably be depended on. The winter in this region is most delightful during the day. The air is dry, clear and sharp. But during the hours between sunset and sunrise the air is very cold, accompanied by sharp frosts. Often the pools of water are frozen over, but the ice melts soon after the sun rises. Snow falls but rarely, in some places once in five or six years, and that in no great quantity. While these remarks apply generally to this whole area, it will be understood that the climate will vary somewhat as we approach or recede from the mountains which form its boundary.

To enable an idea to be formed of the climate of the different Divisions, I shall quote from the reports of competent medical observers on their different towns and districts.

At the extreme east of this area lies the Division of Albert. From Burghersdorp, the chief town of this Division, Dr. Kannemeyer thus reports:—"The chief summer months are hot and relaxing during the day:—the mid-winter nights are cold. During the rest of the year the weather is temperate and delightful. The sun is rarely obscured, never for a whole day, mostly and gratefully by thunder-clouds during the hot summer afternoons. We live practically under a cloudless sky. Our principal rainfall is in summer, sharp and short thunderstorms. These showers are very refreshing. The range of temperature in summer is high on the plains. In the Stormbergen (Mountains) it is more equable, the heat never oppressive during the day, nor are the nights cold; and there is more verdure and humidity. In winter, the days are cloudless, rainless, sunny, and very dry on the plains. Between sunset and sunrise, the air is very cold and frosty. Snow is rare. The mountainous parts are cold and comparatively damp,—frosts heavy and snow occasionally. Mists or fogs are unknown on the plains; in the mountains they occur frequently."

A little further to the West of Albert, and not far from the Sneuwberg range of mountains, lies the Division of Hanover. From Hanover, the chief town of this Division, Dr. Wm. Bourke sends the following report:—"The climate of this district is a particularly dry and bracing one. The winter is seldom severe,—being comparable to that of the South of France, the days throughout that season being bright and balmy. On only one occasion was the thermometer known to register 20° of frost. The

summer months are warm, and in the absence of the light prevailing winds, they approach a tropical heat; but as a rule you can depend on a gratefully cool evening. The sun throughout the year reigns supreme in the heavens, and seldom, indeed, if ever, a day passes without his radiant beams being both seen and felt. For the past three years the average rainfall was 10·2 inches—distributed on an average over 34 days or portion of days in the year. There is little or no snow during the winter."

To the West of Hanover lies the Division of Richmond. Dr. Fick thus reports of his town and district:—"To the South and East, the district of Richmond is bounded by a formidable range of mountains, the Sneuwbergen, one point of which, the Compassberg, is the highest in the Cape Colony, being 7,800 ft. above sea level. During winter we often have beautiful days—no wind or dust—a cloudless sky—a bracing air, and the sun sufficiently strong to make staying out of doors a pleasure. The winter nights are cold—the minimum of temperature measured once by me was —8°C. When the summer sets in the windy days begin, bringing a great deal of fine and coarse sand even through closed shutters. Mornings and afternoons are always fresh and pleasant even in the hottest time of the year. In summer, heat at midday is piercing, but not oppressive."

To the North of the Divisions of Hanover and Richmond lies the large Division of Hopetown, having for its northern boundary the Orange River. From Hopetown, the chief town of the Division, Dr. E. B. Muskett thus reports:—"The surrounding country consists chiefly of large plains, often sandy, with hills, some of considerable elevation. The town itself is situated in a valley opening towards the Orange River, the river being distant about 1½ miles. The prevailing wind is from the Westward, and blows frequently with force during the early summer months. The thermometer may rise to 100° F. in the shade in summer and fall to 20° F. in winter. The air is extremely dry. Rainfall very scanty, said to average 5 inches, and falls almost entirely in thunder-showers, rain without lightning being rare. Snow is rare, but tolerably severe frosts occur at night in winter. Ice always melts before the middle of the day."

Further to the West of the Division of Richmond, and forming the apex of this triangular area lies the extensive Division of Fraserburg. From its chief town, Dr. H. P. Butler reports as follows:—"In winter there is dry cold for the most part, but the frost is very severe, sometimes registering 19°. In summer it is very hot and dry in daytime; but the evenings are very pleasant, being cool. The sun is rarely obscured either in summer or in winter. The thermometer varies in summer from 90° to 110° F. in the shade. In winter it varies from 24° to 70° F. The rain-

fall is very slight, being 2 to 4 inches for the past few years. Snow often falls in winter. The air is very dry."

From the Division of Carnarvon to the North of Fraserburg, Dr. Hanau reports very much in the same terms as those of Dr. Butler.

When we take into consideration the extreme dryness and porous nature of the soil, the great elevation above sea level, the temperature and dryness of the air, the practically cloudless sky, permitting almost constant outdoor life, and if to these we add the scantiness of population and the absence of hurry, worry and bustle which characterise European life, we have an almost ideal set of conditions requisite for the alleviation and cure of certain diseases of the lungs, and especially phthisis. I say *cure* of phthisis advisedly, because cases of cure are within the experience of almost every medical man practising in this area. Further, the all but complete absence of pulmonary phthisis in persons born and bred in this area is proof of the favourable operation of the above conditions in this direction. The most convincing proof, however, is afforded by the record of cases by competent medical men.

In a personal experience of ten years practice as a physician, in a district in the Division of Colesberg, with a population of about 3,000 white and coloured, and including all ages, only *two* cases of pulmonary phthisis came under my care, originating in natives of the district, but neither of which were tubercular. One case was that of a girl aged 16; she had a slight attack of pneumonia, which ultimately developed into phthisis. After careful treatment she gradually recovered, married, and is now the mother of several children. The other case was one of syphylitic phthisis in a married woman. She died in childbed. Several cases from near the coast of this Colony, and from Europe, came under my care with phthisis, all of which were greatly benefited by residence, and followed active and useful lives. One case especially I can call to mind, that of a Mrs. A. B., who, in spite of extensive disease of both lungs, carried on an active business, reared a large family of children, and nursed for some years a paralytic husband. The only signs of illness she exhibited were occasional attacks of coughing, and in the summer slight streaks of blood in the spectum. I am fully convinced that had this patient been living at or near the sea coast of this Colony, or in any part of Great Britain, she would long ago have succumbed to this dire disease, whereas she is alive and actively employed at this present time.

The following short history by Dr. E. B. Muskett, of Hopetown, of two cases which came under his notice within the last few years, speaks volumes :—

"R. P. and C. P., two brothers, aged respectively 18 and 19 years, arrived in Hopetown three years ago. Their two elder

brothers died within eighteen months of rapidly developing consumption. On the death of the last they took fright, and had their lungs examined by two physicians, separately, one a specialist. Both pronounced the young men to be suffering from the incipient stages of phthisis, and recommended them to leave England immediately, which they at once did. On examination of their chest on their arrival in Hopetown, both were found to be in an almost similar state—dullness over a considerable area at the apices of both lungs, more pronounced on the left side, lengthened expiratory murmur, some crepitation, flattening of the chest in the affected region and diminished movement. In addition they suffered from muscular weakness, shortness of breath on exertion, and loss of flesh. They also had slight cough but no expectoration. At the end of *six months* the physical signs had much diminished, and they had regained strength and flesh, the younger so much so that his clothes were too small for him. At the expiration of *a year*, the physical signs *had disappeared*, and they *felt otherwise well*. Now, after *three years* the one *pursues a laborious profession in Kimberley*, the other *has returned to England*; both are in the enjoyment of excellent health."

Dr. Fick, of Richmond, thus reports of his own case:—"I, myself, am a fair sample of a man who has benefited by residence in this climate. I came from Germany in 1879, partly because I was suspected to be Consumptive. After a few years stay in Richmond, my whole appearance was altered. I became hale and hardy, and had gained in weight 40 lbs., weighing 180 to 190 lbs."

From Burghersdorp in the Division of Albert, Dr. Kannemeyer reports as follows:—"I have more than once had the opportunity to see cases of phthisis coming from Europe, but too far advanced for cure, derive temporary benefit during their sojourn amongst us. Incipient or early cases at once improve. Hitherto invalids frequenting this part of the country in search of health have made their stay too short, or have come too late. Continuous residence is necessary to establish a cure. There are about half-a-dozen persons residing in this town at present, leading useful lives, who came here as confirmed invalids, and whose lives have been undoubtedly saved by continuous residence."

From the town of Hanover, Dr. Bourke sends the following:—"There seems to be a special immunity from Consumption enjoyed by the inhabitants of this district, as it is seldom if ever met with among the people born and bred in this district. . . . . There are to my knowledge two cases of Consumption in this district to all intents and purposes cured. The individuals in question arrived from England with the disease in a most aggravated form; and now after several years residence, they are practically restored to their former health and vigour. The late District Surgeon of this

place is another instance in point. For notwithstanding the advanced stage of the malady on his arrival in this Colony, he was enabled, through the beneficial effect of this climate, to carry on the arduous duties of a general practitioner for *ten* years; and it was only on his return to England that he succumbed to the disease. Other two cases occur to my memory in which the patients are being gradually restored to health and vigour."

Dr. J. Hanau sends the following instances from the town of Carnarvon:—"A German gentleman (a missionary), about 54 years of age, is reported to me by good authority, as having suffered from Consumption some twelve to fifteen years ago. He is now so well that as long as I have known him, he has not required medical attendance. Another German, aged 30, in whose family there is hereditary predisposition to Consumption, became ill in this Colony, and exhibited signs of phthisis after an attack of pleurisy. He is now attending to his business, and seldom requires professional advice.—A young gentleman, aged 21, born in Cape Town, with a family predisposition, was warned by his former medical attendant, and while resident in Cape Town was constantly troubled with attacks of Bronchitis, now finds himself as well as possible, and is never troubled by his old complaint."

The late Dr. L. Gogol, District Surgeon of Murraysburg—a district to the South of Richmond,—in reporting to the Government in the year 1882, says:—"During a practice extending over five years, I have not hit upon *one* patient with pulmonary phthisis, born in this or the adjoining districts."

These are but a few of the examples of benefit devided from residence in this area. If space permitted, their number could be very largely increased by drawing on the case-books of any physician practising within its limits. They will, however, suffice to establish the truth of the statement, that not only can phthisis be alleviated and life prolonged, but that it can actually be cured by a sufficiently long residence.

Although, from the grave nature of the disease, and because of the brilliant results recorded of its cure, phthisis has been chiefly and especially mentioned, this is not the only disease benefited by residence. Many cases of Asthma and Chronic Bronchitis are on record where benefit has been derived. Indeed, speaking generally, cases requiring a dry warm air and altitude are all benefited.

With a record such as the foregoing, it would seem strange that the advantages of residence here are not more widely known and generally used by Europeans than they at present are. One reason for this is the fact that sufficient attention has not been drawn to it by medical men in the European Medical Journals. But the chief reason for its neglect is the fact that until quite

recently it was very difficult of access. Before the discovery of the Diamond Fields, which lie beyond this area, it was to Europeans at least an unknown country, the usual mode of travelling at that time was the slow ox-wagon or on horseback. When the wealth of Kimberley attracted a large population from all parts of the world, the ox-wagon gave place to the speedier passenger coach and the post-cart. These are now supplanted by the Railway, which runs right through the centre of this area into Kimberley beyond. What was twelve years ago a journey causing much expense, time and trouble, can now be accomplished with cheapness, speed, and all the ease and comfort of a Pullman car. What it formerly took days to accomplish can now be executed with comfort in hours.

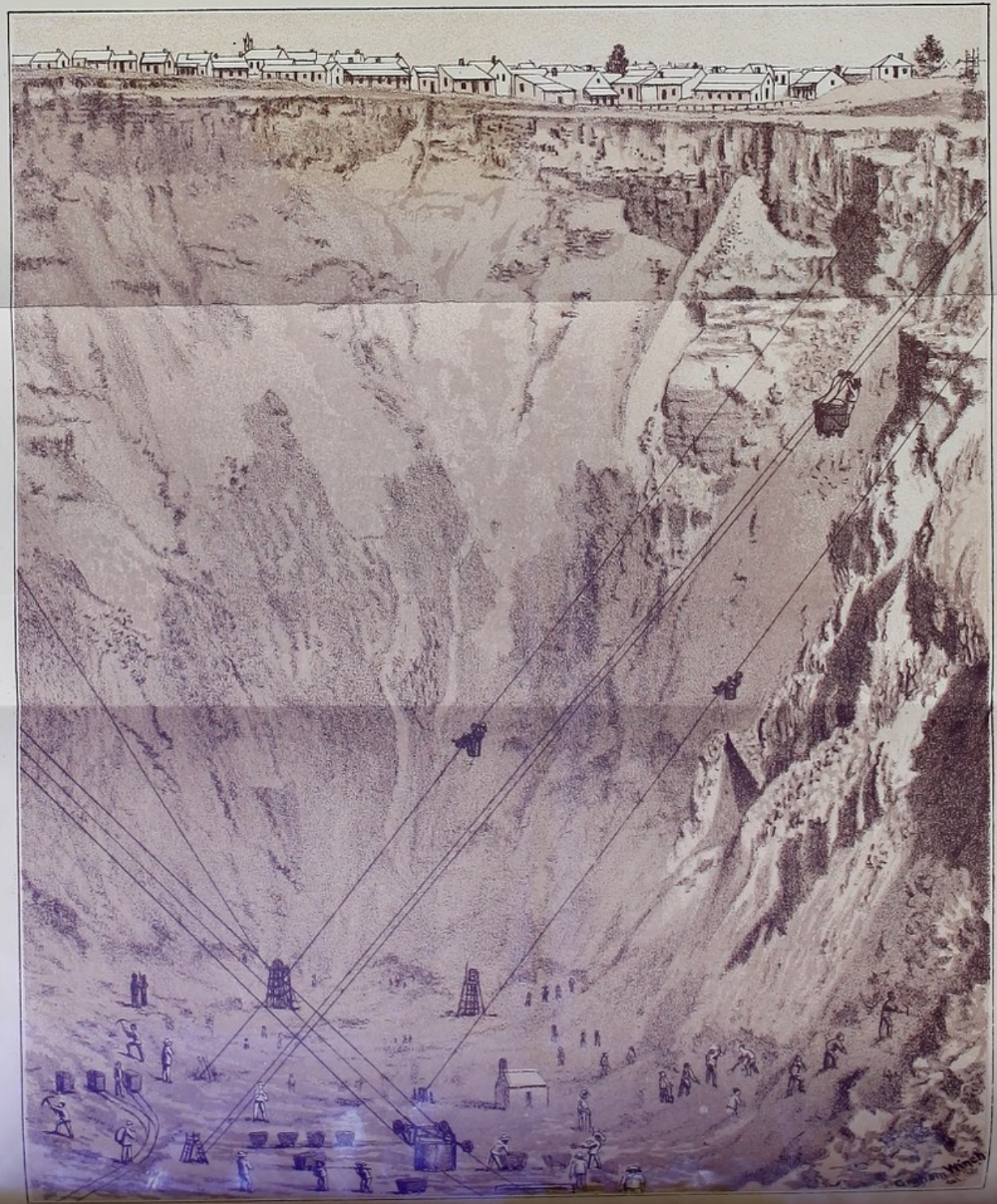
There are no Hospitals or Sanatoria for the reception of invalids in this area. Those, therefore, who contemplate a residence here will have to depend upon Hotels, Boarding Houses and private lodgings. Board and lodging in any of these establishments ranges from £6 to £12 per month according to the mode of life and accommodation. For those who contemplate housekeeping on their own account the following information will be of service. Unfurnished houses are obtainable in most of the towns and villages, and cost from £2 to £6 10s. per month according to accommodation. Domestic servants are almost all drawn from the coloured classes. Their wages range from 15s. to 30s. per month with food. These servants as a general rule are by no means of the best, but often very good, well trained, and faithful servants are to be met with. The general rule is that servants do not sleep in the houses of their employers, but leave for their own homes at night and return early in the morning. With regard to food, beef and mutton are cheap and plentiful, the average price being 6d. per lb.; Bread, 2 lb. loaf, 6d. Milk and Butter depend so much on the nature of the seasons and the rainfall, that no general rule holds good for the whole area. After a good season with heavy rainfall, both butter and milk are plentiful, and the latter very good in quality. The prices will then range for butter from 1s. to 3s. per lb., and for milk 3d. to 4d. per quart bottle. In dry seasons, again, milk is scarcely to be had for payment, but where it can be had it varies from 4d. to 8d. per quart bottle, while butter ranges from 2s. to 4s. per lb. Canned or imported milk and butter are both extensively used during the dry seasons. During the summer eggs are cheap and plentiful, but during the winter they are dear and scarce: the price varies from 1s. to 2s. 6d. per doz. When the towns are situated on or near a river, such places, for example as Aliwal North, Colesberg, Hanover, Philip's Town, Hope Town, river fish are obtainable. In winter, sea fish can be had by rail from the different Coast Ports. No prices can be stated

for this kind of food, as it is looked upon more as luxury than necessary, and the supply is irregular. With regard to Fruit and Vegetables, the same remark applies as to butter and milk, all depends on the nature of the season. If rain is plentiful, and there are no untimely frosts, fruit and vegetables are abundant, cheap, and of good quality in most of the towns. Amongst the fruits grown in the town or on the surrounding farms, the chief are Oranges, Naartjes, Apples, Pears, Plums, Peaches and Apricots, Grapes, Figs, Mulberries, Loquats, Pomegranates, Quinces, Water Melons and Musk Melons.

Of the towns and villages within this area, and in which invalids would naturally be inclined to live, it may be said that they vary very much in appearance and size, according to the amount of water supply for irrigation purposes, and their age. Where water is abundant, foliage is plentiful, and the town or village has a cheerful and comfortable appearance; where it is absent, the town has a dry and desolate look. There is here none of the historical associations, the beauteous landscapes, the refined society, or art collections of a Mediterranean health resort, nor the grand scenery of the Swiss Alps. The characteristics are, rather, a rough, wholesome plenty, and a free and primitive state of society. Many of the towns are dull and dreary, and when an invalid has no employment, time will hang heavy on his hands. It must be distinctly understood that a cure will not be the result of a few weeks or months stay, but extend into years; indeed, it cannot be too often repeated, that to ensure a cure continuous residence is necessary. It must also be remembered that, although the English language is pretty generally spoken in the towns and villages, the prevailing language is Dutch, and that the habits and customs of the people are in many ways different from what prevails in Europe.

In spite of these disadvantages, after a few years residence, the free and easy mode of life in these country towns becomes very pleasant, and is often looked back to with regret on the return to a large city. The conclusion of the whole matter is, what will not one do for dear life! To gain this one pearl of great price, all others can be dispensed with.

One word with regard to clothing. Many people, on leaving Europe for this country, load themselves with light, and omit to take warm clothing, supposing the latter not to be necessary. This is a great mistake. As will be seen from the foregoing reports, the nights are *very* cold, especially in midwinter. It should be distinctly understood that exactly the same kind of clothing is necessary here as in Great Britain. Flannel and tweed are just as essential here as in the North of Scotland. Bearing this in mind will save much useless expense.



DIAMOND MINING AT THE CAPE.

By Theodore Reunert, M. Inst. M.E.

The existence of diamonds is recorded in such primitive times and their occurrence is so widely distributed over the globe, that it is impossible to say when and where they were first discovered. Even if the mention of the diamond in the Book of Exodus (chap. xxxix, v. 11) amongst the jewels in the high priest's breast-plate be declared an error on the part of the translators, there is evidence enough that diamonds were possessed by the Hindoos and Greeks many centuries before the Christian era; nay, it is declared on good authority that the history of the Koh-i-noor may be traced back for 5,000 years, at which remote period it is celebrated in one of the songs of the Vedas as having formed part of the treasures of an old Indian chief. There is little doubt that the earliest known diamonds came from India. The writers under the Roman Empire and those of the Middle Ages who allude to diamonds and their origin, refer only to the Indian mines, and, indeed, until quite modern times no other source of supply was known.

The Indian mines are scattered along the whole centre of the peninsula from near the southern bank of the Ganges in the province of Bundelcund, lat. 25° N., to the banks of the Pennaur River in the Madras Presidency, lat. 15° N. The famous mines of Golconda are in the Nizam's Dominions, about lat. 17°, though it is probable no diamonds were ever found in or near the city itself. To-day the only Indian mines regularly worked are the northern ones at Punnah in Bundelcund, but the total yield is of trifling importance to the world's traffic, the bulk of the production being consumed by the local markets, the principal of which is at Benares. It is estimated that the annual weight of Indian diamonds exported to Europe does not exceed 100 carats. They are chiefly interesting through their historical associations, nearly all the celebrated crown-jewels of Europe having been derived from India. The opening of the Brazilian mines at the beginning of the last century practically closed the mines of the Deccan.

The Brazilian diamond-fields are situated in the Serra do Espinhaço, a chain of mountains running parallel with the coast between Bahia and Rio Janeiro, following the direction of the 43rd meridian between latitudes 10° and 20° north. In this range occur the renowned mines of Diamantina in the province of Minas Geraes, but other rich diamond mines exist in the very centre of the Continent near Villa Bella (or Masso Grosso), at Cuyaba and other places on

the Paraguay river. For a hundred and fifty years these mines continued to supply the world with diamonds, till the discovery of the vastly richer diamond deposits of South Africa ruined the Brazilian trade, as that had previously ruined the Indian mines.

Several other widely distant countries have yielded diamonds, though in much less quantities than India and Brazil. In the North American continent diamonds have been found in North Carolina, Georgia, Arizona, California, as well as in Mexico. Two countries in Europe have also supplied a few stones In the year 1829, some diamonds were discovered in the gold washings on the European side of the Ural Mountains near the iron mines of Bissersk, and a single diamond is reported to have been found at Dlaschkowitz, in Bohemia. Small quantities are said on doubtful authority to occur also in Algeria, and in some parts of Siberia. More important than any of the last named are the mines of the East India Archipelago. About the year 1840 diamonds were found in Sumatra, subsequently in Celebes, but the island of Borneo alone in that group has continued to produce a regular supply, sending, it is computed, about 3,000 carats annually into the European market. One of the largest diamonds in the world, a pure white stone of 367 carats, was found near Landak in Borneo; it is still uncut and belongs to the Rajah of Matam. One other diamondiferous region only, but that completing the number of the continents, remains to be mentioned. Diamonds were discovered in Australia in the year 1852, and again in 1859, on the Macquarie River in New South Wales, 100 miles north-east of Sydney, also ten years later near Rylstone on the Cudgegong River, and latterly at Bingera near the Gwydir River, in the extreme north of the Colony, about lat. 30° S. long. 151°.

The Diamond Fields of South Africa, though of later discovery than any of the above, have eclipsed them all in richness and extent. They are situated north of the Orange River, in the province of Griqualand West, at a distance of 500 miles from the coast, and an elevation of 4,000 feet above the sea. The story of their discovery, of which many slightly different versions exist, is as follows.

Early in the year 1867, a trader named John O'Reilly, travelling southwards from the Orange River, rested his oxen at the farm "De Kalk," the property of one Schalk van Niekerk, in the Hopetown district; and this is Mr. O'Reilly's account of what he saw there, given in a letter addressed some five years later to the Governor of the Cape Colony, Sir Henry Barkly :—

"In March, 1867, I was on my way to Colesberg from the Junction of the Vaal and Orange Rivers; I outspanned at Mr. Niekerk's Farm, where I saw a beautiful lot of Orange River stones on his table, and which I examined. I told Niekerk they were very

pretty. He shewed me another lot, out of which I at once picked the "first diamond." I asked him for it, and he told me I could have it, as it belonged to a Bushman boy of Daniel Jacobs. I took it at once to Hope Town, and made Mr. Chalmers, Civil Commissioner, aware of the discovery. I then took it on to Colesberg, and gave it to the Acting Civil Commissioner there for transmission to Cape Town to the High Commissioner. The Acting Civil Commissioner sent it to Dr. Atherstone, of Graham's Town, who forwarded it to Cape Town."

Dr. Atherstone wrote back to the Colesberg Commissioner—Mr. Lorenzo Boyes, who is still a member of the Civil Service in another part of the Colony—"I congratulate you on the stone you have sent me. It is a veritable diamond, weighs 21¼ carats, and is worth £500. It has spoiled all the jeweller's files in Graham's Town, and where that came from there must be lots more." Dr. Atherstone's opinion was confirmed by Messrs. Hunt and Roskell, the Crown jewellers in London, to whom the stone was sent for inspection, and it was subsequently purchased at the above valuation by Sir Philip Wodehouse, who preceded Sir Henry Barkly in the Governorship, and who sent it to the Paris Exhibition of 1867.

It may be imagined that Messrs. Boyes and O'Reilly, who shared the proceeds of this sale, were well satisfied with their bargain. They lost no time in returning to the scene of the first discovery, where others soon joined in the exciting search, but the success was so small that for another two years the existence of diamond fields in South Africa continued to be disputed. However, in 1869, Van Niekerk secured from a Griqua or Hottentot a large stone for which he gave the sum of £400 or live-stock to about that value, and which he sold directly after to Messrs. Lilienfeld of Hope Town for over £10,000. This was the famous "Star of South Africa." It weighed 83½ carats in the rough, and was estimated in June, 1870, to be worth £25,000. It has been cut, and now figures amongst the jewels of the Countess of Dudley, its present weight being 46½ carats.

When it was clearly authenicated that a gem of such value had been found, the first large "rush" of diggers made their way up to the Orange River, but it is a curious fact that though the earliest finds were in the Hope Town District no mine has been discovered there. However, careful prospecting soon proved that the banks of the Vaal River were rich in diamonds. The searching parties worked their way from the junction of the Orange and Vaal up the latter stream as far as Hebron, leaving detachments of diggers along the whole course. About 100 miles above the junction following the windings of the river, they reached Klipdrift, or Barkly, which little town has since remained the

centre of the twenty or thirty mining camps where with more or less of intermission and with varying success the banks of the Vaal have continued to be explored for diamonds up to the present time (1886).

In 1870 a large population, numbering not less than 10,000, chiefly males, had spread itself along the river, constant recruits arriving from all parts of South Africa, with a goodly sprinkling of Yankees and other keen-witted miners, who brought to bear on the new industry their valuable experience gained in California and Australia.

In the latter part of 1870 news came of the discovery of diamonds some twenty miles further south, about midway between the Vaal and Modder Rivers, near to where the town of Kimberley now stands, and many of the River Diggings were soon abandoned by the rush to the farms of Dutoitspan and Bultfontein. The improvement was not very encouraging. Neither the river diggings nor the newly opened mines were sufficiently rich to prove remunerative to so large an influx of workers with the primitive appliances at their disposal, whilst the change from the green banks and shady trees of the limpid Vaal to the arid sand of Dutoitspan, where water even for domestic purposes was almost a luxury and at times quite unobtainable, was not conducive to cheer the spirits of men whose hopes of speedy fortune had been rudely disappointed.

Hardly a more dreary existence can be imagined than that of the early days on the Diamond Fields. Comforts there were absolutely none. Not a single substantial dwelling afforded shelter from the burning sun: men lived under canvas, and the owner of an iron or wooden shanty was looked upon as a lord. If you crossed the street you trod ankle deep in sand, and probably before reaching the other side a small dust storm in embryo had choked and blinded you. The dust and the flies, and worse, pervaded everywhere; they sat down with you to meals and escorted you to bed. The want of good food and pure water brought on disease, and many a poor fellow who had expected to find an Eldorado on the Fields succumbed to the fever which threatened to become endemic. Yet the men who had subjected themselves to this sort of life were mostly fresh from the comforts of civilization. There was an entire absence of the rowdy uncouth class such as peopled the "Roaring Camps" of the far West. The expense and difficulty of reaching the Diamonds Fields, even from the nearest towns of the Cape Colony, kept rogues and loafers out of the place. Though distant only 650 miles from Cape Town, and 500 from Port Elizabeth, the journey from the latter port occupied a month and six weeks from the former. It had to be performed in a springless transport-wagon, drawn by ten to sixteen bullocks, over roads

that no description could convey the vileness of, and the cost per passenger was not less than fifty pounds.

To-day all this is changed. The railway, which has placed the Diamond Fields within 30 hours' journey of the coast, now brings a daily supply of all the luxuries the Colony can produce, whilst the establishment of the Kimberley waterworks provides a constant store of good and cheap water, which not only removes the greatest hardship of the early days, but gives an impetus to gardening, so that thousands of trees have been planted, and nearly every house now boasts its flower-plot. In the last five years large sums have been spent in building and other permanent improvements. The town has been drained, paved, and lighted, and the public health has so greatly improved that "camp fever" is said to be dying out, and seldom now proves fatal.

The talisman that has wrought these alterations and converted within fifteen years a diggers' encampment into a thriving populous city, is the wealth produced by Kimberley Mine.

Early in the year 1871 a new digging was discovered two miles distant from Dutoitspan, in a north-westerly direction, and situated on a farm named Vooruitzigt, the property of one De Beer, from whom it was termed "Old De Beer's." And on this same farm in July, 1871, the famous "Colesberg Kopje" or "De Beer's New Rush," as it was variously called, was discovered by a Mr. Rawstorne of Colesberg, which town had thus the honour of giving its name to the richest mine in the world. By a Government proclamation issued three years later (see Statute Law of Griqualand West, No. 7 of 1874) these diggings were converted into "Mines" with the respective titles of "Dutoitspan Mine," "De Beer's Mine," and "Kimberley Mine." The Bultfontein diggings were not proclaimed a mine till 1882 (Proc. No. 210 of '82).

Kimberley Mine lies due West of De Beer's, and Bultfontein Mine is to the South West of Dutoitspan. The centres of Kimberley and De Beer's Mines are exactly one mile apart, the centres of De Beer's and Dutoitspan just over two miles, whilst the centres of Dutoitspan and Bultfontein are less than three-quarters of a mile. A circle three and a half miles in diameter would enclose the whole of the four mines.

The three adjacent farms containing these four Mines changed hands very shortly after the opening of the diggings. The real name of the farm containing the Dutoitspan Mine is Dorstfontein. This farm was owned in 1870 by one Van Wyk, Dutoit having been the former proprietor, whilst the neighbouring farm of Bultfontein belonged to another Dutchman named Du Plooy. The owners had at first issued "briefjes," or licences to dig, at a trifling charge, but the growing number of diggers soon proved too great for their pastoral tastes, and both owners disposed of their

property to Mr. H. B. Webb, through whom it eventually passed into the hands of the London and South African Exploration Company.

The Vooruitzigt estate was similarly purchased from its owner, De Beer, by Messrs. Dunell, Ebden and Co., a Port Elizabeth firm of merchants, for the sum of £6,000.

The new proprietors of the several farms were not slow in raising handsome revenues out of the diggers, and not a few complications arose as the rapid development of the industry, particularly on Vooruitzigt, demanded an ever increasing area for the prosecution of the digging operations.

In addition to the disputes between landlord and tenant, international difficulties arose respecting the right of government over the whole territory of Griqualand West.

The Orange Free State (which had been converted into a Republic out of the British Orange River Sovereignty in 1854) held nominally the reins of government over the digging population till 1871, but its organisation was manifestly unfit to maintain law and order amongst that growing independent community. Moreover its right to the territory was more than questionable, the true owner being doubtless the chief of the West Griquas, Nicholas Waterboer. This chief had previously petitioned the British Government to take him under its protection, and on a renewal of his prayer, backed by many of the diggers, his allegiance was accepted, and Sir Henry Barkly, as Her Majesty's High Commissioner in South Africa, by a Proclamation of 27th October, 1871, declared Waterboer and his tribe to be British subjects, and their territory British territory.

The Free State officials retired, but their government continued to dispute the legality of the annexation. However in 1876 the President, Mr. Brand, visited England, and on 19th July of that year a convention was signed in London between Lord Carnarvon and himself, whereby the Free State relinquished all future claim to the territory of Griqualand West, and received from the British Government the sum of £90,000 in substitution.

The administration of the province was for a couple of years entrusted to three Local Commissioners; but in 1873, a change being needed, Mr. Richard Southey was appointed Lieutenant-Governor of Griqualand West, assisted by a Legislative Council of four nominee members and four elective members. Under this government occurred the memorable "rebellion" of April, 1875, when the irritation of the diggers against their rulers rose to such a pitch that the black flag was hoisted and men openly armed themselves to conflict the authorities. The disturbance passed off without bloodshed, and the subsquent purchase by the Government of the farm of Vooruitzigt for the sum of £100,000 led to a mitiga-

tion of the grievances. Mr. Southey was recalled, and Colonel Crossman sent out from England to investigate the matter, he being in his turn succeeded by Major Lanyon, who acted as "Administrator" till January, 1879 (when he was removed to govern the Transvaal), and Colonel Warren was appointed "Acting Administrator," in which office he was followed nine months later by Mr. J. Rose Innes. Mention should be made of the good service rendered by the Diamond Fields Volunteers in the Native Wars of 1878-9, which, as well as the sentiments displayed at the time of the Transvaal (1879) and Bechuanaland (1885) Expeditions, proved the loyalty of the Mining Community.

On the 18th October, 1880, Griqualand West was formally incorporated in the Cape Colony. The annexation was much opposed on the Fields at the time, but probably the presence of Griqualand West Members in the Cape Parliament has assisted the passing of wholesome measures needed for the protection of the diamond industry.

The Diamond Trade Act (No. 48 of '82) was passed on 30th June, 1882, the Precious Stones and Minerals Mining Act (No. 19 of '83) on 27th September, 1883, and the Regulation of Trade in Diamonds within the Colony Act (No. 14 of '85) on 25th July, 1885. The object of these Acts is to consolidate and amend the various Mining Ordinances promulgated by the Griqualand West Government, also to place restrictions on the traffic in diamonds; to constitute a Special Court at Kimberley with power to inflict heavy penalties (up to fifteen years' imprisonment with hard labour) on those convicted of unlawful possession, illicit dealing, and theft; to provide for the better management and supervision of the diggings and mines; and finally to extend the diamond trade laws enforced in Griqualand West to the whole of the Cape Colony.

As early as 1869 a few boers and Kafirs were scraping on the surface of the Du Toit's Pan farms, but their finds were insignificant, and the appearance of the ground was so different from the diamondiferous deposits worked on the Vaal, that the diggers at the River paid slight attention to the dry workings. Even after the four mines of Du Toits Pan, Bultfontein, De Beer's and Kimberley had been successively "rushed," no one suspected what a vast depth of diamond-bearing rock they contained; they were supposed to be merely another kind of alluvial deposits, and consequently operations were conducted without thought of permanency, which has most seriously impeded the subsequent development of the Mines.

Before describing in detail the "Four Mines" which have given stability to the diamond industry of South Africa, a few words may be said about some surrounding diggings in diluvial soil which caused a little excitement four or five years ago, but nearly all of

which have since been abandoned as unpayable; indeed, it is doubtful whether at some of these so-called "mines" any diamonds at all were discovered.

The years 1880-81 witnessed the memorable "share mania" on the Fields, during which not only most of the private holdings in the four mines were converted into Limited Liability Companies, but the immense demand for mining shares set a number of prospectors at work searching for new mines, and trying to open up others which, though previously known, had either never been worked or were already abandoned. Thus, whilst each morning's paper announced the formation of some fresh company for working claims in one or other of the established mines, hardly a month went by but some new digging was "rushed," till nearly every landowner in the district had begun finding diamonds on his farm. The game was a lively one whilst it lasted, and though these speculations proved entirely disastrous to the rashly investing public, they yielded for some time a considerable revenue in claim and stand licences to the Government or proprietors, as the case might be.

In 1881 three new diggings were allotted on the Vooruitzigt Estate, namely, St. Augustine's Mine, Taylor's Kopje, and Otto's Kopje, all situated to the westward of Kimberley Mine, and the consequent additional revenue to the Government in licence moneys amounted for that year to £4,000; in 1882 it had sunk to less than half this amount, whilst in the following two years it dwindled down to next to nothing at all, evidencing the total abandonment of the diggings. A similar fate attended the digging of Kamfer's Dam, some three miles to the north-west of Kimberley on the Barkly Road, where large sums of money were wasted on the erection of costly machinery. Meanwhile some half-dozen dry diggings had been "rushed" beyond the Orange Free State border, not one of which continues to be worked to-day, except Jagersfontein, an old-established mine, 80 miles south of Kimberley, in the Fauresmith district, which still produces about £50,000 worth of diamonds annually, of a peculiarly white quality, about midway in value between Kimberley and river stones. Five dry mines have also been discovered in the Barkly district, on the tongue of land formed by the junction of the Harts and Vaal Rivers. Of these, Victoria Mine and Newlands "No. 1" were opened in 1881, "Newlands No. 2" in 1882, Wrigley's and Borrell's Kopjes both in 1883; but after yielding a revenue of about £2,000 per annum for the years 1883-4, they have all been declared abandoned, except Newlands "No. 2," an exceedingly small digging, not to be called a mine at all, consisting of only some 10 claims within the "reef," which here is a sandstone of unknown depth. A diamond of 6 carats

weight is said to have been found here. Within the last few months a company has started working St. Augustine's Mine. It is situated within the Kimberley township, not much over a quarter of a mile from the latter mine, and contains only about 70 claims.

The Kimberley Mine was opened to the public on the 21st of July, 1871. It is situated near the centre of the town of Kimberley (that has since sprung up round it) in lat. 28 deg. 42 min. 54 sec. S., long. 24 deg. 50 min. 15 sec. E., at a height of 4,050 feet above the sea, so that the mean height of the barometer is about 26 inches.

In the face of a good deal of opposition from the diggers, the Government (Orange Free State) Inspector of Mines wisely decided to lay out the claims on a different plan than had been adopted at the three mines previously opened. Instead of allotting the whole area within the mine to be worked as the diggers thought fit, he insisted on a reserve strip off each claim being left unworked to form roadways. The size of a claim in Kimberley Mine is a square measuring 31 feet by 31 feet, the mine itself forming an irregular ellipse, of which the major axis points approximately east and west. The roadways were designed to run parallel with the claim-lines across the narrower width of the Mine from north to south, and each roadway was fifteen feet wide, half of this width being cut alternately from the east and the west of successive claims, leaving a space of 47 feet of workable ground between the roads, so that each claimholder lost a strip of $7\frac{1}{2}$ feet off one side of his claim. This loss of ground was more than compensated for by the extra facilities for working afforded by the roadway.

The richness of the new mine was apparent from the outset. The demand for claims was so great that they were subdivided, first into halves and quarters, then down to eighths and sixteenths. By law no individual could hold more than two claims, and the "blocking" of claims was also prohibited, so that although there were only about 500 claims in the mine, the number of holders was more than threefold, or about 1,600. Many diggers who had only paid the customary license of 10s. per month for their claim, disposed of it for over £100, and the value went on increasing from month to month, till ten years later claims changed hands at £10,000 to £15,000 each. But this is anticipating the chronological order of events.

It has been said that the roadways facilitated the working of the Mine. They were 14 or 15 in number, numbered from east to west, and the names of them still survive for convenience of describing spots in the mine, or on the plans, though every vestige of them has long since disappeared. As early as the beginning

of 1872 they began to be unsafe; the working down of the claims on either side in perpendicular walls left precipitous caverns on both sides of the roads, and many were the accidents both to the workers below and to the carts and passengers along the roads before the latter began to cave in. The appearance of the mine at this period of its development was most picturesque; hundreds of carts and wheel-barrows careering along the roads, bearing their precious freight of excavated ground clear of the mine to be sorted; down below, at all distances from the surface, a succession of rectangular ledges, representing the various working levels of different claims, where thousands of diggers and native labourers, crowded together on the narrow working spaces, were busy picking and shovelling the ground and filling it into the original tubs and buckets of all sorts and sizes employed for conveying it to the surface; some of these were hauled up by ropes and tackle, others carried by hand up inclined planks and staircases cut in the perpendicular walls; each man worked on his own device, without regard to his neighbour, the only general rule being that the roadways must be kept intact. Whether from design or accident, it frequently happened that masses of the high ground subsided, leaving great chasms in the roads that had to be bridged over by the owner to enable the traffic to go on, and by the middle of 1872 the number of these slips had increased so as to leave the roadways little more than a succession of bridges thrown across the mine from block to block of claim-ground. It became evident then that some change in the system of working was needed, but whilst men were wondering what it was to be, the remaining solid portions of the roads collapsed, converting the whole works into ruins. Some of the diggers were in despair and sold out at once, thinking the mine could never recover from such a disaster. But it was only the first of a series of unanticipated mishaps that Kimberley Mine has experienced, and that any less rich property would have succumbed under.

It is to be regretted that no statistics have been preserved of the number of workers employed in the mine at this period. It can hardly have been less than ten thousand or twelve thousand, and is estimated by many at double that number. The problem, now the roadways had collapsed, was how to work the large number of separate holdings, so as to preserve free access to each, and still let no claimholder encroach or trespass on his neighbour's ground.

As a temporary expedient, the endless rope principle of haulage was adopted, a couple of grooved wheels being fixed, one on the margin of the mine, the other in the claim, whilst to the endless rope passing over these wheels the bucket was attached, which was filled with ground in the claim, and then hauled up and down by

a handle on the upper wheel. The objection to this method was that the entire circumference of the mine did not afford frontage enough for the erection of a hauling gear to each claim, and further, that, even had the frontage sufficed, the crossing of ropes would have been a serious difficulty.

Both these difficulties were overcome by the following ingenious device. A succession of tall massive timber stagings were erected round the margin of the mine. Each staging carried four or six platforms one above the other, every platform serving as an independent level from which to communicate with the claims below. Stationary ropes were then stretched from the platforms to the claims, the upper platforms communicating with the claims in the centre of the mine, the lower platforms with those nearer the margin. On each platform from ten to twenty grooved wheels were fixed, over which the ropes passed which brought up the buckets from the mine, the bucket being swung from the guide or stationary rope by a little overhead pulley and frame of original design. The hauling ropes were attached to windlasses on the surface-level, each windlass being worked by four Kafirs. The buckets most generally used were constructed of leather, and the ropes of twisted hide, till the introduction of galvanised iron and later of steel-wire ropes gradually superseded them. Arrived at the level of the platform, the bucket was tipped into a narrow shoot, down which the ground ran into a bag held ready to receive it, in which it was conveyed away to be sorted. The din and rattle of these thousands of wheels, and the twang of the buckets along the ropes were something deafening, whilst the mine itself seemed almost darkened by the thick cobweb of wires, so numerous as to appear almost touching one another. This mode of haulage continued in vogue during the whole of 1873, and if the appearance of the mine was less picturesque than whilst the roadways existed, it was, if anything, more arresting in its uniqueness.

The year 1874 witnessed the establishment of the first Kimberley Mining Board (under Ordinance No. 10 of '74) the internal affairs of the Mine having been previously managed by a Diggers' Committee. The depth of the Mine had now reached 100 feet, and with the increased depth many unforeseen difficulties arose. The first of these was an accumulation of water in the lower workings; then the encasing rock of the Mine, or the "Reef," as the diggers called it, being exposed by the removal of the diamondiferous ground, began to disintegrate and fall into the Mine. Claimholders in the centre of the Mine suffered most from the water; those near the margin were most troubled by the reef; but it soon became a recognised principle that both reef and water should be treated as common enemies, and accordingly a general rate was levied on the whole mine to deal with them. The water

difficulty would never have been serious, had anything like adequate pumping appliances been provided, as no strong springs were met with in the workings, and it was mainly surface drainage that had to be dealt with. Much more serious have been the reef troubles, forming a long chapter of accidents in themselves, from which the mine has not even recovered at the present day.

The first necessity was to provide more powerful hauling machinery than the hand tackle hitherto employed. The "horse-whim" was introduced in 1874, a large timber wheel, some 20 feet in diameter, fixed horizontally 8 feet above the ground with an iron hoop reaching down to the level of horse's or mule's collar. The hauling wire, wound several times round the whim, had its two free ends attached to two buckets, one of which ascended from the mine as the whim revolved, whilst the other bucket was lowered down.

This enabled larger tubs of two or three cubic feet capacity to be used, till the introduction of steam engines in the following year gradually replaced all other motors. It may seem surprising that the advent of steam power was so long delayed, but when it is borne in mind that the cost of transit from the coast was £30 to £40 per ton, and that no one could foresee the diamondiferous soil would have extended to such an unprecedented depth, surprise on this score vanishes.

Indeed, in reviewing the history of diamond mining in South Africa, the perfectly novel features of the industry must never be forgotten. It is easy to look back and criticise, but to the pioneers of the industry there was absolutely no previous experience to be guided by. It was a perpetual groping in the dark and a necessary waiting for events, and the wonder is that, with all the drawbacks of the situation, so much should have been accomplished.

Before tracing the more recent development of Kimberley Mine, a short description may be given of the methods employed for extracting the diamonds from the ground brought to the surface.

The earliest method was that known as "dry-sorting"—analagous to the use of the "baby" at the River diggings—and consisted merely in sifting the excavated ground through hand sieves, thereby separating the finer portions from the stones and coarse gravel, and then passing the latter over a sorting-table. By this method as many diamonds were missed as found, but the scarcity of water rendered any process of washing the ground inexpedient at the outset.

An enormous quantity of ground from all the four mines was sorted on this principle, the resulting sand or refuse, being known as "Debris," has formed the huge heaps of yellow mounds which still disfigure so large a portion of the township. Since the era

of washing machines the most of these debris-heaps have been washed, and the re-sorting often yields better results than were obtained from the maiden ground by the dry process.

The first washing machine was a modification of the "cradle" used at the River, and consisted of an inclined plane on rockers, a number of transverse ribs across the plane arresting the heavier stuff whilst the lighter ground flowed over the ribs, leaving the rough gravel behind the latter. This was known as the cradle-ripple washing machine, and was used from 1874 to 1875, when the Rotary Machine was introduced.

The Rotary Washing Machine is still almost universally employed at all the four Mines. It consists of an annular shaped pan, eight to fourteen feet in diameter, being closed by an outer and an inner rim, the latter being about four feet diameter and not so high as the outer rim. A vertical shaft rotates in the centre of the open space, and carries ten arms ranged radially round the shaft, each arm having about six vertical knives or teeth which are set to be within half-an-inch of scraping the bottom of the pan. The diamondiferous ground mixed with water enters through an orifice in the outer rim of the pan, and is stirred up into a ripple by the revolving knives, whereby the lighter stuff comes to the surface and continually floats away through an orifice in the inner rim, whilst the heavier gravel falls to the bottom of the pan. For additional safety the teeth are set so as to form a spiral in revolving, and co-operate with centrifugal force in throwing every stone they strike towards the outer rim of the pan. The mud or "tailings" which flows to waste over the inner rim is led by a shoot to a pit, whence it is lifted by a chain and bucket elevator some twenty or thirty feet high. At the top of the elevator the buckets deliver the tailings on to suitable screens, over which the solid mud runs to waste, whilst the muddy water is led back by an overhead shoot to the machine, to assist in forming a puddle of sufficient consistency to float the lighter stones in the pan and allow only the heaviest gravel to accumulate at the bottom. For the better mixing of this puddle an inclined cylindrical screen is fixed above the level of the pan. The dry ground from the Mine is tipped into the upper end of the screen, where it is met by the muddy water from the elevator and a certain amount of clean water. The large stones of a size unlikely to include diamonds roll out at the lower end of the cylinder, but the puddle, carrying all the smaller stones with it, passes through the wire netting of the screen and down a shoot into the pan, as above described. At the end of the day's work, the machine is stopped, and the contents of the pan emptied on to the sorting table, first undergoing an intermediate process of cleaning, either in an ordinary "cradle" or a small gravitating machine, styled a "pulsator."

The "pulsator," well known in principle as applied to most ore-washing, is employed by some diggers so as entirely to dispense with the "panning" process, and affords complete satisfaction.

Returning now to the operations within the Mine, something more must be said about the ill-starred Kimberley Reef, that has earned for itself a world-wide reputation by its awkward interference with workings that, without its presence, would have bestowed fabulous wealth on the claimholders. Like the malignant elf who came uninvited to the festival and succeeded in mixing a curse with all the previous blessings, the reef has been the bane and nightmare of Kimberley Mine and its owners.

To deal more effectually with the reef removal the Mining Board erected costly hauling machinery on the north-east and south-west corners of the mine, at the same time sinking a large vertical shaft through the reef at the north-east corner some 200 yards back from the limit of the claim-ground. At the depth of 286 feet from the surface an exceedingly hard rock was struck upon, and the further sinking of the shaft abandoned. But it is deplorable that no tunnels were driven towards the mine on the surface of this rock, as they might certainly have been used for removing a large quantity of dangerous reef from the north and east margins, which subsequently fell into the mine, and had to be hauled out by the claimholders at an increased cost, after serious stoppage of payable work. For conducting operations on a larger scale tramways were laid to supersede Scotch carts, and the hauling gears in use by the diggers were improved, so as to accommodate tubs of an increased capacity. The whims had only drawn up tubs of 3 to 4 cubic feet, but the first steam engines in 1875 hauled tubs of three to four times that size. At the same time the aerial standing wires of each gear were increased from two to four, each tub having a carriage with four grooved wheels running on two wires. The size of these standing wire-ropes has been perpetually increased, till to-day the largest are $4\frac{1}{2}$ to 5 inches in circumference, and the largest hauling ropes 2 to $2\frac{1}{2}$ inches, the power of the hauling engines advancing in the same period from 6 to 25 and even 50 nom. h.p.

Early in the year 1878 one quarter of the claims were covered by reef; this was being hauled out at a cost to the Board of 4s. per load of 16 cubic feet. In the years 1879-80 the Board's expenditure on the removal of reef, debris, and water exceeded £300,000, although the reef tariff had been reduced from 4s. to 2s. 6d. per load. At the end of 1881 the Mining Board had 7 miles of tramway in use, whilst another 12 miles had been laid down by claimholders. During that year the Board expended over £200,000 in reef removal; but the work had been commenced too late, the slips became ever greater, so that in 1882 more than *half-*

a-million sterling was needed to defray the cost of the reef actually removed, and still claims were covered and other slips impending. The bulk of this removal had been done by the claimholders themselves, at the Board's expense. A couple of private shafts had been sunk some years previously, one on the north, the other on the south reef, at distances of about 450 and 650 feet respectively from the limit of claim-ground, and through these shafts a quantity of the upper reef was removed by means of tunnels and "passes," the fallen reef from the lower claims being hauled out by the aerial trams. A third shaft sunk through the north-east reef to a depth of 100 feet in the latter part of 1882, was used for lightening the top reef in that part of the mine; whilst inclined tramways on the west and east sides of the mine were conducting similar operations in the open. Notwithstanding all these appliances the reef removal did not keep pace with the constantly recurring slips. The tariff had been raised in October, 1881, to 3s. 9d. per load, and during the following eighteen months the reef hauled by claimholders alone cost the Board over £650,000. Unable to meet this large expenditure by cash payments the board had recourse to bills, with the result that by the end of March, 1883, its books showed a deficit of over a quarter of a million sterling. The local banks refusing then to discount its reef-bills any further, a financial crisis arose, causing a dead-lock in the operations of the mine. Outsiders freely stated that Kimberley mine was ruined.

During 1882, in spite of the unprecedented amount of reef removed, more than half the claims in the mine remained encumbered, and even these were only able to be worked intermittently, so that the total operations for the year showed three loads of reef hauled for every single load of diamondiferous ground. It is probable that had this heavy quantity of dead work been performed systematically, spread over a number of years, and with due regard to economy, the whole mine might have been cleared of dangerous reef long prior to this date, and without any excessive strain on the finances of claimholders or the Board. The total amount of solid and fallen reef removed since the opening of the mine in 1871 to the end of 1882 was under ten million loads of sixteen cubic feet each; but of this amount nearly one-third, or almost three million loads, had been removed in the year 1882 alone. The gross cost to the Board, up to this date, had been about one-and-a-half million sterling, expended on reef removal alone (in addition to expenses of removing water and debris), and yet nearly an equal amount of reef remained to be removed to make the mine permanently safe for open working, and of this quantity of dead-work still to be done a large portion was urgently called for, if it was not to be too late to afford relief to the workings

threatened, or already submerged. As evidence of how tardily and expensively the past reef removal had been conducted, it may be stated that if the work had proceeded uniformly through the previous ten years, instead of being mainly done in the four years ending 1882, it would not have entailed a greater expenditure than £10,000 per month; and that such a burden might have been borne without inconvenience is shown by the fact that in the eighteen months ending 31st March, 1883, the self-imposed rates borne by claimholders exceeded £32,000 per month, and yet during that period less than half the area of the mine was yielding a revenue and the price of diamonds was lower than it has ever been before or since. In the month of June, 1882, the enormous sum of £70,000 was expended on reef removal alone. Taking the above considerations together, it is not too much to say that the burden of reef-removal has been *six-fold* greater on claimholders than it need have been.

Still, as previously remarked, these statements must not be regarded as conveying any serious reflection on the ability of those who had the mining operations under their control. It is easy to be wise after the event, and in Kimberley Mine it would have been miraculous had no mistakes been made, new in every respect and fraught with a succession of surprises as the development the mine has been.

At a depth of about 100 feet below the surface the appearance of the diamondiferous soil suddenly changed. Hitherto it had been of a soft friable nature, yellowish in colour, and crumbling as soon as exposed to the air. But below that level it grew gradually harder and altered from yellow to a slate blue colour. Once more a panic seized the workers, who thought this time the bottom of the mine had been surely reached. It was soon found, however, that the "blue ground," (as it was called) also pulverised after short exposure to the atmosphere, and that far from being barren of diamonds, it yielded even better returns than the upper layers of "yellow ground." It is now known that the latter is simply the "blue ground" changed from its original toughness and colour by the action of the atmosphere. The deepest sinkings in Kimberley Mine are now 600 feet below the surface, but the nature of the "blue" has not altered, except by becoming harder and more crystallised. The rocks encasing the diamond-bearing soil were also found to undergo a corresponding change. The surface of the whole country is covered with red sandy soil, varying from a few inches to a couple of feet in depth; underneath this is a thin layer of calcareous tufa never extending beyond a few feet; both these layers are of recent date, even still in course of formation, and are found equally over the Mine and the surrounding country. But beneath the lime the distinction between the Mine proper and the

outside rocks or "reef" first becomes apparent. The upper reef in Kimberley Mine is a yellow shale, exhibiting many varieties of shade from grey to pink. This extended to a depth of 35 to 50 feet, beneath which as the contents of the Mine, or diamond-bearing "pipe," were worked out, a layer of black carbonaceous shale was made visible. The strata of both shales are roughly horizontal, though much disturbed in places, and where cut through by the vertical "pipe," they have their edges turned sharply upwards, as by a pressure from below. At a depth varying from 260 to 285 feet from the surface of the red sand the lower shale ceases, giving place to an unstratified basaltic rock, the "hard rock" of the miners. The extent of this hard rock is as yet unknown; though not quite all the "blue" has been removed to this level, it has been recently ascertained that the basaltic rock encircles the entire mine. It is an amygdaloidal dolorite, identical in character with the bed-rock at the Vaal River diggings, and the quantity of agate it contains renders it most expensive to sink through. In the shale on the south side of the mine a lump of coal was discovered, and within the mine itself charred wood fossils have been found. Thin veins of calc-spar are of frequent occurrence, vaalite, mica, iron pyrites and hornblende, are disseminated throughout the "blue," besides fragments and masses of shale, sandstone, and boulders of dolorite. Though elaborate analyses of the diamond-bearing rock have been made, its precise nature is still doubtful; a catalogue of all it contains would fill a page. It is a hydrous magnesian conglomerate, with silica as a base. The generally accepted theory is that the "pipe" is the funnel of an extinct volcano, and that the diamond-bearing rock, which now fills it and forms the mine, has been upheaved from a vast depth, the diamonds themselves being of earlier date than the upheaval.

The discovery of the hard rock practically confined the reef difficulty within manageable limits, as there is little doubt the former will stand without disintegrating, even when exposed to a great depth. But the experience of successive reef slips has considerably increased the estimate of the shale to be removed to render the mine safe for working on the open or quarry principle. It was first supposed the reef would stand if cut back to an angle of 60 degrees receding from the mine. Then for several years 45 degrees was spoken of as the angle of repose, and now it is found that an angle of 30 degrees will be needful. A scheme was started some five years ago for cutting down the reef to a safe angle in spiral terraces, and heavy rolling stock and locomotives were procured for the purpose, but the work was undertaken at too low a rate—1s. 7d. per load of 16 cubic feet—and the contractors, Messrs. Teague and Co., failed before much more than a commencement had been made.

As before stated, the bulk of the reef has been removed by the fixed hauling gears of claimholders themselves, either through shafts or by aerial trains. The excavated reef was tipped in long embankments branching out to the north and west of the mine, without much regard to the valuable areas thus encumbered and broken up. This tipping should have been confined to one locality, so as not to interfere with the space needed for washing operations and depositing sites, a vast area being required for spreading out the excavated blue ground in thin layers to enable it to pulverize.

The yellow ground pulverized so readily that it could be taken direct from the mine to the washing machines. As a consequence these were fixed much too near the margin of the mine, and the accumulation of "tailings" as well as of "debris" from the "dry-sorting" days aggravated the subsidence of the reef. This was further hastened by the heavy blasting carried on in the mine, the toughness of the "blue" necessitating the use of dynamite.

An immense quantity of this explosive is annually consumed on the Fields, and the careless storage of it led to the terrific explosion of the 10th of January, 1884, when, probably through the accidental ignition of petroleum stored in the immediate vicinity, twelve powder-magazines, containing 30 tons of dynamite, 10 tons of powder and blasting gelatine, and several hundred thousand detonators and rifle cartridges, were blown to atoms. Luckily, little damage was done to life or property, beyond the value of the explosives themselves, estimated at £17,000, but the horrible report of the explosion and the ghastly column of smoke which seemed as if it would bear down the town, as well as the scene on the ground after the disaster, will not soon be forgotten by those who heard and saw them. The smoke-column, over a thousand feet high, was clearly visible at the farthest River Diggings, 35 miles away. The hours of blasting on the Fields are at mid-day and after sunset, and a stranger hearing it for the first time would fancy himself in a besieged city. The firing in the four mines continues for ten or fifteen minutes. It is most interesting to stand on the margin of one of them, looking down into the vast cavern, and watch the shots go off. Some are fired by battery, others by slow fuse; the fuse may be seen smoking, then follows the dull heavy report, and a few seconds after the mass of detached ground slowly breaks away, rolling down till it finds a resting place, where it remains ready for loading into the tubs when the labourers return and work is resumed.

Kafir labour is mainly employed in all the less responsible operations of the mines: in drilling holes for the dynamite cartridges, in picking and breaking up the ground in the claims and *trucking* it to the tub lowered to receive it; then in trucking it away from the depositing boxes and the margin of the mine and

tipping it on the depositing floors, where it undergoes a variety of processes before it is ready for washing, and is again filled into trucks and driven to the machines. For every three truck-loads of ground daily hauled out of the mine there is on an average one Kafir labourer employed, and to every five Kafirs there is one white overseer or artizan. In 1882 the number of native labourers in Kimberley Mine was 4,000; but in 1884, owing to the serious stoppage of works, they had sunk to 1,500. These labourers are recruited from 16 or 20 different native tribes from various parts of the Colony and the Interior, the proportion of the several tribes at any time on the Fields varying greatly according to the internal state, whether of peace or war, of the district whence they hail. Out of 20,000 natives arriving in search of work in the first half of 1882, 8,000 were Secocoeni's Basutos, 6,000 Shangans, 1,500 British Basutos, and 1,000 Zulus, the balance consisting of representatives of no less than 16 other different tribes and races. The market afforded for the employment of native labour and the consequent development of native trade is not the least of the incidental benefits conferred on South Africa by the discovery of the Diamond Fields.

It was remarked above that had the reef removal, performed up to the end of 1882, been spread uniformly over the preceding ten years, instead of done under urgent pressure in the last five, the mine might have been kept clear of reef slips without any excessive burden of rates on the claimholders. Even in 1883, after more than a *million and a half sterling* had been spent on this work, the mine might rapidly have been cleared of what had already fallen, and subsequent reef slips averted, could the work have been continued with the same vigour as exhibited during 1882, and by the present time the whole margin of the mine would have been worked down to a safe angle. There can be no question that, considering how much of this work had already been completed, it would have been the wisest plan to proceed with it, as though nearly an equal quantity still remained to be done, the reduced cost of working in these latter years would have enabled the expenditure of another million sterling to see the mine permanently clear of its reef troubles. Unfortunately, the funds for the prosecution of further dead work on a large scale were not forthcoming. Several attempts to obtain a loan in Europe for this purpose were abortive, mainly, no doubt, through a clashing of interests and want of unanimity amongst the claimholders themselves. That the mine had ample security to offer must be evident to anyone acquainted with its capabilities. Notwithstanding its encumbered position, with not one quarter of its claims free to yield diamonds, and in spite of an unprecedented fall in prices, the year 1883 saw Kimberley mine turn out

diamonds to the value of £846,706. In the following year, owing entirely to the stoppage of payable work through continuous reef-slips, the production had fallen to £634,332; whilst in 1885 it has been only £458,858, or not more than the mine produced in the last four months of 1882, viz., £456,420. Had it been possible to continue the open workings, there is no doubt the annual production would have exceeded one million sterling. How Kimberley has suffered through the cessation of energetic reef-work may be seen from a comparison with the other three mines of the district, which, being shallower and also larger in area, have so far had little interference from reef-slips. In the eighteen months ending February, 1884, Kimberley mine produced 1,429,727 carats of diamonds, being equal to the combined production of Bultfontein and Dutoitspan, each of which mines produced a little over 700,000 carats in the same period. In the following eighteen months ending 31st August, 1885, Kimberley produced only 850,396 carats, as against Bultfontein 877,648; De Beer's, 790,908; and Dutoitspan, 773,307.

The area of Kimberley mine, originally enclosed within the reef, was about eleven statute acres. Successive slips and removal of reef have widened this area, till to-day the huge orifice presented to the spectator displays a gap of twenty-five or thirty acres. If the reef were cut back to the 30° angle, the mouth of the orifice would measure over 40 acres or about one-sixteenth of a square mile.

The enclosing rocks of the mine, which form the walls of the diamond bearing "pipe," are not perpendicular, but converge inwards from the surface downwards. The average dip of the reef or shale was 1 in 3, forming a natural angle, before it began to shell off, of about 70 degrees with the horizon. The hard rock, which is reached at a depth of about 270 feet from the surface, also inclines inwards, though at a much less rate than the shale. The average inclination of the hard rock is about 1 in 12, and it is greater at the south than at the north side of the mine. It will thus be seen that the area of claim ground is constantly reduced as the mine deepens.

The last Mining Board assessment shows 331 claims on which licences were still paid at the end of 1885, but some of these are claims at the west end of the mine, on which a quantity of high ground is still standing. The actual size of the mine at the level of the top of the hard rock is not more than 280 claims, or about 6 acres. How deep this continual "cutting-out" of claims will extend cannot yet be ascertained. It is stated that in some of the lowest underground sinkings, more than 600 feet below the surface, the rock is found to recede from the mine, thus regaining a certain area of diamondiferous ground.

This contingency, which is likely enough to happen, has been provided for in the Precious Stones and Minerals Act of 1883 (Section LXIX) in which it is enacted that the whole mine shall participate in any such event, the diamonds from such expanded claims to be the common property of the then registered claim-holders, with a reservation of 2½ per cent. of their gross returns to the Government.

The greatest depth to which workings in the open mine had extended by the end of 1885 was 450 feet. The cubical contents of this huge cavity measure about 9,000,000 cubic yards, of which about half represents the reef hauled out, and the other half diamondiferous ground, both "yellow" and "blue." The yield of diamonds from this big excavation since the opening of the mine in 1871 to the end of 1885 has probably exceeded seventeen and a half million carats, equal to three and one-half tons weight of precious stones, in value about £20,000,000, whilst the total weight of reef and ground excavated exceeds 20,000,000 tons.

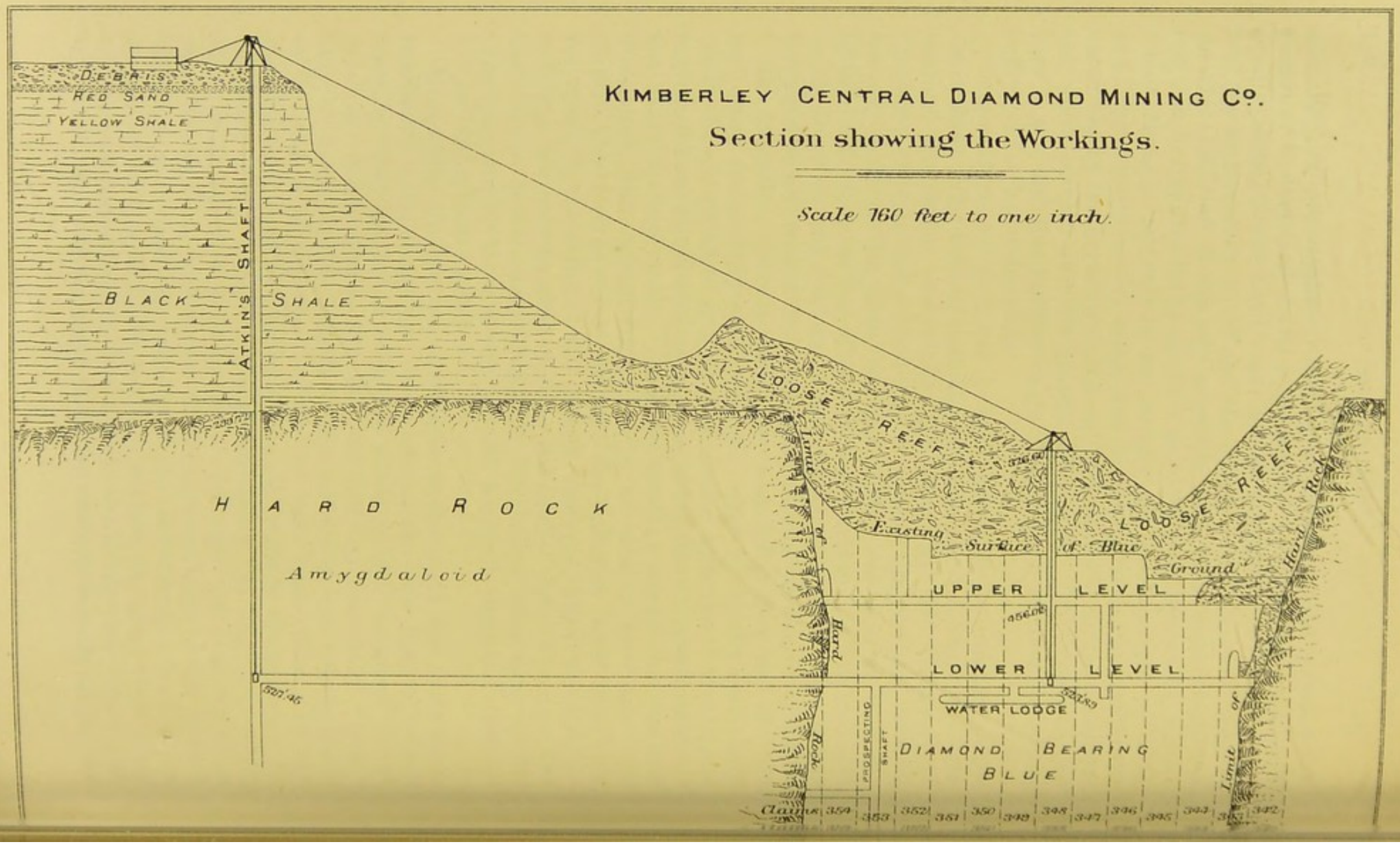
Large fortunes had been made out of Kimberley Mine prior to the bulk of the claims being formed into companies in 1880. But even since that date, in spite of all the drawbacks of the situation, the profits made whenever work could proceed have been enormous. One company with a capital of over £100,000 paid back in the three years after formation 87 per cent. in dividends to the shareholders, and another company with a capital of a little over half a million paid within the same period nearly £300,000 in dividends; whilst a third company with a capital rather under £350,000, and which was £33,000 in debt at the end of 1883, managed to pay off the whole of this liability in the following year, besides showing £15,000 to the good; and in 1885, after paying out £27,500 in dividends, there was still a profit of over £40,000 to carry forward. Slowly, but surely, Kimberley mine is recovering from the reverses of the last three years, and it may confidently be stated that a most brilliant future awaits it. With ground yielding, on an average, from 10s. to 30s. profit per load (equivalent to 30s. and 90s. per cubic yard), even the colossal burdens it has been suddenly called upon to bear, joined to an almost total stoppage of works, and wholesale destruction of property through reef-falls, cannot do more than cause temporary depression in the fortunes of the mine. It is probable that out of the gross returns mentioned above fully seven millions sterling have been nett profit.

A few words must now be said about the manner in which the mine has overcome the accumulation of reef troubles which three years ago seemed to threaten it with disaster. The dilemma was really a most grave one. The financial position of the Mining Board rendered a continuance of heavy reef work in the absence of outside assistance impossible. Still less could any individual

claimholders contemplate reaching their submerged grounds by means of tunnels and shafts sunk outside the mine, the expense of boring through the hard rock, besides being too costly, was too lengthy an operation to afford the speedy relief that was needed. At this juncture a mining engineer who had been conducting large reef contracts for some time previously propounded a scheme which, though startling in its novelty and pooh-poohed by most practical miners at the time, was shortly afterwards carried into execution by the inventor at his own risk, and has actually enabled the mine to tide over its gravest difficulties. The question was how to get out diamondiferous ground at once without the prosecution of further dead work.

"Jones System," as it has been styled after its inventor, overcame these difficulties in the following manner. A shaft was sunk through the fallen reef within the mine, on the "coffer-dam" principle of gradually lowering a square timber box, without bottom, through the loose stuff, shovelling out the reef from the inside, and fixing-on box after box to the first one, till it had sunk right down to the bottom of the fallen reef, forming a strong timbered shaft within the latter, and resting, at last, on the solid "blue ground." In this mode more than a hundred feet of loose reef were successfully sunk through, after which the shaft could easily be extended to any desired depth into the "blue," and tunnels driven in all directions, so as to continue the excavation of the mine underground. The great merit of the scheme was that it entailed little initial outlay, whilst as soon as the "blue" was reached the work of "opening up" the galleries more than paid for itself, in the value of the ground removed, which was reached within a few months after starting the shaft. At the present day there are no less than six shafts in Kimberley mine sunk on this principle, and by their means several hundred thousand loads of "blue" have been hauled out.

Meanwhile, the two private shafts on the north and south reefs, previously mentioned, have been deepened; the former having recently been connected with the underground workings in the mine at a depth of over 520 feet, so that the excavated "blue" may be hauled either direct to the surface, up the outside shaft, or to the level of the bottom of the open mine up the internal shaft, and thence by the aerial trams to the surface. In the event of any further reef-slips damaging the head gear of the latter shaft, egress will be preserved through the former, and as even this shaft is rather near to the present edge of the Mine, second outside shaft has been sunk 120 yards further back, down to the top of the hard rock, and a tunnel driven along the surface of this rock connecting the two outside shafts together. Connected with this system of workings there are two other shafts within the


KIMBERLEY CENTRAL DIAMOND MINING Co.
Section showing the Workings.
Scale 160 feet to one inch.
DEBRIS
RED SAND
YELLOW SHALE
ATKIN'S SHAFT
BLACK SHALE
HARD ROCK
Amygdaloid
LOOSE REEF
Limit of Hard Rock
Existing Surface of Blue Ground
UPPER LEVEL
LOWER LEVEL
WATER LODGE
PROSPECTING SHAFT
DIAMOND BEARING BLUE
Limit of Hard Rock
LOOSE REEF
Claims 354 353 352 351 350 349 348 347 346 345 344 343 342

mine, making three mine shafts and two outside shafts in all. The main tunnel connecting the deeper outside shaft with the shaft in the centre of the mine is 700 feet long, of which 500 feet are driven through the "hard rock," Ingersoll drills, with compressed air, having been used for the purpose. The lower half of the deep shaft is also sunk through the hard rock to a depth of 230 feet through the latter, and at the bottom of this shaft a large direct-acting condensing steam pump is fixed, capable of dealing with the whole drainage of the mine. Tramways are, of course, laid through all the underground tunnels as well as on the level of the open workings in the mine, the material consisting chiefly of light steel rails, 12 to 14 lbs. to the yard, and light wagons of 16 cubic feet capacity, constructed wholly of steel, the gauge of tramway being 18 inches. The shafts are made to accommodate two cages, each holding one of these wagons, of which one ascends whilst the other goes down, and the wagons arrived at the top of the main shaft are drawn away to the depositing floors by locomotives. The mode of excavation adopted is shown on the accompanying plan of section of the mine.

Where the main tunnel cuts through the junction of the hard rock or "blue," a couple of cross tunnels are driven at right angles to the first one, and running in opposite directions till they reach the boundaries of the company's claims. These cross tunnels have therefore a wall of hard rock on one side, whilst the roof and other side are solid "blue." The excavation is then continued by cutting down the "blue" from the roof overhead, but instead of trucking away the "blue" as it falls, the rails in the tunnel are taken up and the "blue" allowed to pack underfoot, the miners therefore being continually climbing to a higher level, whilst the height of the tunnel in which they are working remains uniform, just high enough for them to be in touch with the roof. In order to preserve safe means of access and egress for the workers in this continually rising chamber, a couple of cross headings are driven parallel with it five feet high by four feet wide, branching out at right angles from either side of the main tunnel and leaving a solid wall of "blue" ten feet thick between the cross headings and the working chamber. A number of inclined passes are then driven at a sharp angle through this wall of blue connecting the cross-headings with the working chamber, and where they strike the latter vertical "pass-pits" are carried up, rising simultaneously with the chamber and separated from it by a three-inch plank which prevents the loose pack of "blue" from filling the passes. At last the overhead excavation of the chamber has proceeded so far as to nearly strike the fallen reef which at present covers all the open workings in the mine. The crown of the chamber is then broken through at either end, and the loose reef allowed to enter and pack on the top of the

excavated "blue." A sliding door in the planks at the bottom of the pass-pits is then opened and the excavated "blue" drawn off, sliding down the inclined passes into trucks in the cross-headings, which convey it through the main tunnel and shaft to the surface. As the "blue" is drawn off, the loose reef above it subsides and takes its place till the chamber is entirely emptied of "blue" and filled with reef. The sliding-doors are then closed, and the excavation of that chamber is complete. Meanwhile a second set of cross-leadings have been driven ten feet further back and parallel with the first set, and now the opening up of a second chamber commences which works down the ten-feet wall of "blue" previously left, and also the "blue" above the first cross-headings, vertical pass-pits being carried up as before connected at the bottom by inclined passes with the second cross-headings. A thin partition of solid "blue" is left between the second chamber and the reef which now fills the first chamber, but the operations in this second chamber differ slightly from those of the first. Instead of allowing the "blue" cut from the crown to pack underfoot, it is sent down the inclined passes to the trucks as soon as excavated. In order, then, to continually raise the miners to the level of their work at the crown, the thin partition of "blue" is broken through under foot sufficiently to allow the reef from the first chamber to flow laterally into the second one and afford a footing for the miners. The planks which formed the screens of the first pass-pits are carried into the new chamber by the inflowing reef, and utilised again as screens for the second series of pass-pits, down which the "blue" is being shot as quickly as it can be made loose. A third chamber is started and worked up in the same way as the second, which has been kept a uniform height by the reef flowing in at the feet of the workers, and the reef again from the second chamber is passed on into the third, the supply of reef being kept up from overhead where there is a practically unlimited store of it, as it lies more than a hundred feet thick over what were once the open workings of the mine. When an entire level some sixty or seventy feet thick has in this manner been excavated of "blue" and filled with reef, a set of workings are commenced at a lower level and the reef again passed down to do service there, as it previously passed to the higher level from the open mine. In the manner above described twelve to fifteen hundred loads of rich blue ground are being daily excavated and sent to the surface.

In another part of the mine an entirely opposite system of excavation is being successfully conducted. In this Company's claims a shaft is sunk in the "blue" to a total depth of 512 feet below the red soil, and two sets of workings opened up, one at this lowest level in course of preparation, whilst a first level eighty feet higher is now being worked out. At each level two sets of tunnels

are used one above the other at a vertical distance of fifty feet apart, the upper tunnels being the level at which the excavation of large chambers is commenced which are gradually worked downward, the roof being left untouched and the excavated ground delivered down vertical passes to the trucks in the lower or main tunnels, which are also the level from which the hauling is done. The shaft measures about ten feet by five feet in cross section, leaving room for two cages and a ladder-way, which is used at present for drawing up the ground from the lowest level workings that are being made ready against the time when the 432 feet level will be worked out. No reef is let down to fill up the chambers in this system, but on the contrary, when these have attained such dimensions as to appear unsafe to work in, they are abandoned as underground workings for workings that have been meanwhile prepared at the lower level. What becomes then of the considerable mass of solid "blue" ground left standing in the crown and pillars of the abandoned chambers? As every cubic yard is worth from £3 to £6 it can evidently not be thrown away. A clearance is made of the fallen reef lying around the Company's shaft in the open mine, till the surface of the "blue" is reached, after which it is possible to work down in the open mine until the pillars and crowns of the last abandoned underground chambers have been all removed by the aerial tram. These chambers were fifty feet high in the first level, but it has been found expedient to reduce the maximum height for the future to 32 feet.

Before taking leave of Kimberley Mine it may be well to convey some idea of the large profits which by judicious management may still be drawn from this rich ground in spite of the low price of diamonds.

The following is an abridged Profit and Loss Account of the Company last referred to for the year ending 30th November, 1885:

Dr.	£	s.	d.
To Wages, Salaries, Fees, &c.	49,481	7	0
,, Fuel and Water ..	10,930	0	6
,, Explosives	3,673	17	1
,, Forage & Stable Account	3,523	1	9
,, Material used for Maintenance and Stores ..	5,242	6	3
,, Rates and Licenses and General Expenses ..	3,655	2	4
,, Balance of Profit ..	78,802	13	6
	£155,308	8	5

Cr.	£	s.	d.
By Diamonds Account:			
135,684 Carats at 19/2¾	130,466	5	9
,, Debris, Tailings, &c.: Sold, washed on percentage	880	19	3
,, Hauling for other Companies	1,977	15	6
,, Kimberley Mining Board: Water Hauling, 2,325,296 gallons ..	1,442	7	11
,, Blue Ground on Floors: Less 13,649 Loads at 10/ on Floor Nov. 30th, 1884. 54,731 Loads on Floor on Nov. 30th, 1885, £27,365 10s. 0d.			
Increase 41,082 Loads at 10/	20,541	0	0
	£155,308	8	5

The preceding Account represents the cost and profits resulting from washing 88,185 loads of blue ground (16 cub. feet to the load), which yielded an average of 1·54 carats of diamonds per load, or a total of 135,684 carats, realizing 19/2¾ per carat, so that the value of the ground per load was 29/7. The cost of washing, including manipulation on the depositing floors, was 3/6 per load. The above expenses include also the cost of hauling 125,021 loads of reef, towards clearing the Company's claims, at a cost of 2/ per load; also of hauling by the tubs of the aerial tram 2,325,296 gallons of water out of the mine at a cost of 1/3 per 100 gallons; finally the cost of excavating, hauling, and depositing on the Company's floors 134,701 loads of blue ground, (of which 70,000 loads were drawn from the underground workings) at a cost of 6/9 per load. Thus the entire cost of winning the diamonds from one load of blue ground, including all expenses of management, maintenance, and necessitating the removal of about an equal bulk of fallen reef, and including also a heavy amount written off for depreciation of machinery, amounted to about *sixteen shillings per load*, showing a clear profit of about 13/6 *per load*, or 66 *per cent.* on the gross production.

The De Beer's Mine, situated likewise within the township of Kimberley, on the Government Estate of Vooruitzigt, is similar in formation to Kimberley Mine, though about a fifth larger in area. It is of irregular oblong shape, with a bulge at the south-east corner, and measures about 320 yards over surface from east to west, and about 210 yards from north to south. The reef encasing the mine for a depth of 100 feet is a yellow basalt, after which succeeds a layer of black shale which extends to a total average depth of 290 feet from the red sand at which level the hard igneous rock is struck. Within the mine diamondiferous soil is "yellow ground" to a depth of 100 feet from the surface, followed by an unknown depth of "blue ground." Across the mine from south to north a great belt of blue shale originally covered a large area of claim ground, but the bulk of this inside shale (termed "floating reef" by the miners) has been removed, as the blue ground beneath is known to be peculiarily rich. Just as in Kimberley Mine there is a great difference in the relative richness of ground in different sections of the mine. A belt of rich claims spans the centre of the mine from north to south running out towards the north-east corner where some of the richest ground is found. The western portion of the mine, comprising one third of the entire claims, was left unworked for many years, as it was found on the surface to be unpayable, but the deepening of the workings in the centre of the mine eventually left so high a wall of yellow ground standing on the western boundary that at last it collapsed, causing in March, 1885,

the largest fall of diamondiferous ground that has ever occurred at any of the Mines. Taking warning from the experience of Kimberley the De Beers' Mine has been steered clear of serious reef difficulties. As the deep workings have been mostly confined to the north and north-east sections, it has been possible to cut down the marginal reef in this locality so as to enable the sinking in the open mine to proceed until recent years without much interruption from this cause. In September, 1883, however, a considerable fall of main reef took place in the north-east corner, followed early in the succeeding year by another fall of like magnitude, and when to these troubles was added the huge fall of nearly half a million loads of top unpayable ground from the south-west corner, claimholders were necessarilly forced to consider some alternative to continuous working in the open mine, unless they could contemplate launching into an enormous expenditure for cutting down the reef to a safe angle. As regards the future of Kimberley Mine it is still an open question whether at some not distant date it may not be expedient to continue the reef hauling till the entire mine has been cleared of the rubbish now encumbering it and rendered safe from further reef falls. After nearly two-thirds of this dead work has been completed at a gross cost of some £1,800,000 it may seem wise to complete the remaining third, for which a further expenditure of probably less than £700,000 would suffice, after which the difficulties, dangers and expense of underground working would be reduced to a minimum. But in De Beer's Mine the conditions are quite different. Comparatively little reef work has yet been done, owing to the deep workings being confined to one portion of the mine, the total expenditure on reef hauled at the Mining Board's expense not having exceeded £150,000, whilst a gross cost of something like £2,500,000 would be incurred in cutting down the whole reef to the level of the hard rock. It is therefore apparent that abandoning all idea of grappling with the reef the future excavation of the De Beer's Mine must proceed underground.

This is actually the conclusion which claimholders have come to, and within the last year five out of the seven companies at present holding the entire mine have sunk shafts within the mine for the purpose of reaching their "blue" ground. One company owning a large portion of the east end of the mine has been working its claims for some years past by a large shaft sunk 200 yards outside the reef margin, with a tunnel driven from the shaft into the mine at a depth of 150 feet from the surface. Two years ago another company, the largest holders in the mine, commenced sinking a large circular shaft 1,000 feet outside the northern margin of the mine, which was designed to penetrate the hard rock, but the great expense this would have incurred has induced it to be temporarily

abandoned, and in the place of it an inclined shaft has been sunk on the west margin at an angle of 34 degrees from the vertical. Starting 130 feet back from the boundary of the claim ground, this inclined shaft penetrates the basaltic rock and black shale and enters the claim ground at a depth of 200 feet from the surface, thus missing the hard rock altogether. The extreme length of the shaft is 645 feet, its lowest end being 500 feet vertically below the surface. Two sets of working galleries are opened up, one at this lowest 500 feet level, another set 120 feet higher, at a distance of 380 feet from the surface, and the higher level workings communicate also with the open workings in the mine. The inclined shaft is strongly timbered throughout its entire length and has two sets of rails laid in it, on which a couple of triangular cages pass up and down. Many novel features connected with the devolopment of underground working in diamond mines might be dwelt upon if space permitted, but to the financial mind a few figures relative to cost of working and profit in De Beer's may be of greater interest.

Like Kimberley, this mine has been considerably reduced in size by the cutting in of the hard rock. Recent borings make it probable that at 300 feet below the surface the number of claims left in the De Beer's Mine will be less than 400, or but two-thirds of the original number at surface. The greatest depth reached in the open workings is 370 feet, whilst the underground workings have extended to 530 feet deep. The present area or orifice is about 15 acres, or about two acres larger than the original area of claims at the surface. The area of claim ground at level of hard rock will be probably not much over 8 acres. The mean depth of the mine, as at present developed, is 200 feet, about 60 claims at the West End being still untouched, and a great mass of yellow ground remaining there to be worked. The volume of diamondiferous ground excavated from the whole mine measures about 3,250,000 cubic yards, in addition to some 750,000 cubic yards of main and floating reef. The gross value of diamonds produced by De Beer's Mine between the years 1871 and 1885 inclusive is not much under £9,000,000, representing about $1\frac{1}{2}$ tons weight of precious stones. The present average production in value amounts to £500,000 per annum.

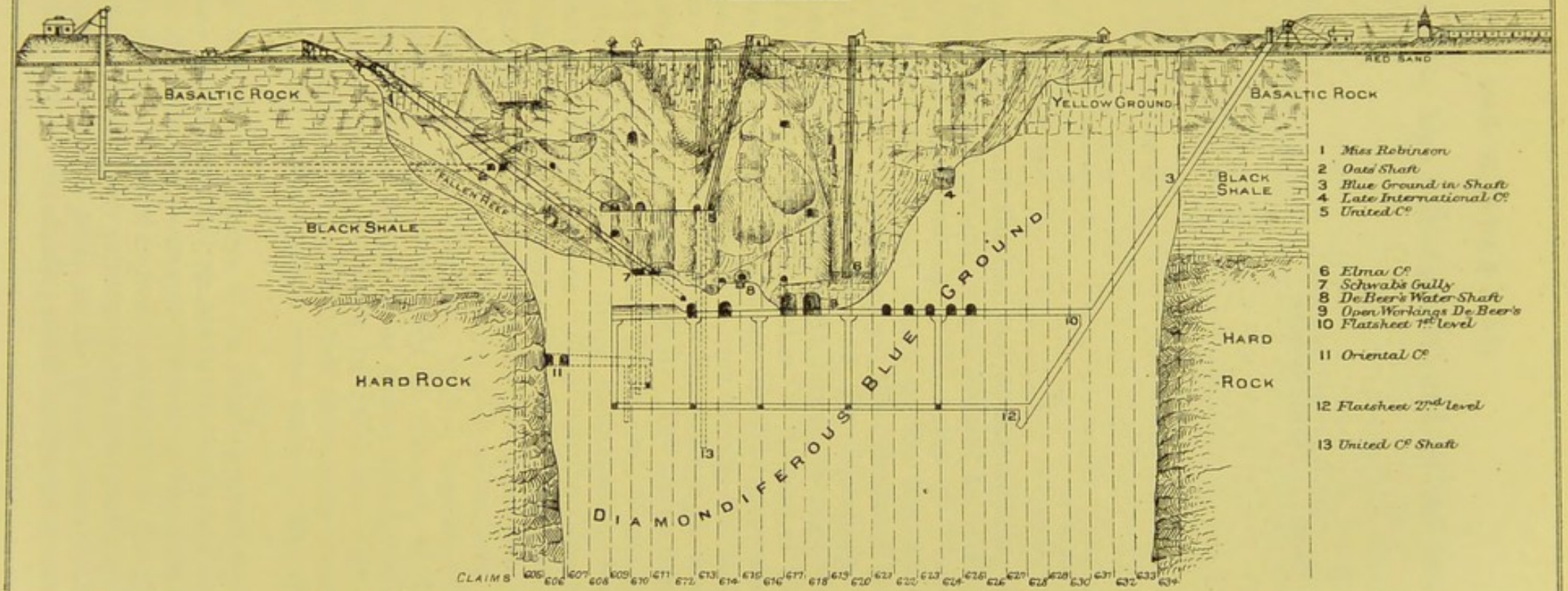
As previously stated, the value of ground from different parts of the mine varies greatly, the best ground in De Beer's being quite as rich as Kimberley Mine.

As an instance of the most profitable working, the following abridged profit and loss account may be taken, shewing the half-year's working for the period ended 30th April, 1885, of a small company of about 11 claims in the central and southern portion of the mine known as the Australian Gully, a deep open working

DE BEER'S MINE

Section from East to West.

Scale 300 feet to 1 inch.



Lithographed in the Surveyor General's Dept. Printed by Saul Solomon & Co, Cape Town.

bounded on the west by high yellow ground, and on the east by floating shale:—

Dr.	£ s. d.	Cr.	£ s. d.
To wages, explosives, stores, &c.	9,088 14 5	By diamond account, 43,045 carats at 17/10¼ ..	38,431 8 9
,, Fuel	1,705 3 9		
,, Produce.	1,022 6 8		
,, Rates and licenses ..	158 12 0		
,, General expenses ..	900 11 11		
,, Decrease of blue ground on floors during half-year, 916 loads at 3s. .	137 8 0		
,, Balance of profit ..	25,418 12 0		
	£38,431 8 9		£38,431 8 9

The above account represents the cost and profits resulting from washing 28,944 loads of blue ground, which yielded an average of 1·42 carats per load, also from washing 5,380 loads of "lumps" (i.e., fragments of pulverized ground which at the first washing were not sufficiently reduced to pass through the cylindrical screen into the pan, and therefore were re-carted to the depositing floor for further weathering there), the lumps yielding an average of 0·56 carat per load. This total washing resulted in the finding of 43,045 carats of diamonds, which realised an average of 17/10¼ per carat, so that the first yield of the "maiden blue" was *twenty-five shillings and four pence per load*, and of the lumps *ten shillings per load*, or 26/6½ *per load* total value of the blue ground. The above detailed expenses included the cost of hauling out 4,871 loads of main reef and 1556 loads of reef and ground for other claimholders, besides hauling and depositing 28,028 loads of "blue" on the Company's floors, so that the entire cost of winning the diamonds from one load of blue ground amounted to *eight shillings and five pence per load*, leaving a profit of 18/1½ *per load*, or 68 *per cent* on the total production of the Company. This Company with a capital a little over £100,000 was nearly £4,000 in debt at the end of 1883, owing to an accumulation of water in its claims which hindered their working, but after starting full work in 1884 this debt was not only rapidly wiped out, but within that same year dividends amounting to 30 per cent of the capital were paid to the shareholders.

As another instance of the richness of Be Beer's ground the case of a small company holding some 17 claims in the north-east corner may be cited, which in the five years since formation has paid back nearly two-thirds of the subscribed capital in dividends to the shareholders; whilst a third company adjoining the last, and about the same size, even more successful still, in the three years 1882-84 paid out over £75,000 in dividends; and lastly, as a case of

successful working on a large scale it may be stated that the company, which now owns two-thirds of the entire De Beer's Mine, has paid out a *Quarter of a Million Sterling* in dividends during the last five years, its capital having meanwhile risen through amalgamation with smaller neighbours from £665,000 to over £1,000,000.

The quality of diamonds produced in the Kimberley and De Beer's Mines is similar, a considerable number of large stones being found in both including a good deal of yellow and spotted ones, the colour being better in Kimberley, but the size larger in De Beer's. The value of a diamond depends on the purity of its colour, its freedom from flaws and spots and its relative size. The finest diamond ever found in South Africa was the famous "Porter Rhodes," discovered in claim No. 375 near the centre of Kimberley Mine on the 12th of February, 1880. It is a pure white octahedron weighing 150 carats, and was valued at £60,000. The largest stone found in De Beer's Mine was one of 302 carats, yellow octahedron, discovered on the 27th of March, 1884, in the east end of the mine.

The Bultfontein mine is situated on the farm of the same name, rather under 2½ miles to the south of De Beer's, and just over 2¾ miles south east of Kimberley, measured from centre to centre of the mines. It is of almost circular shape, about 360 yards across and contained over 1,000 claims on the surface. Owing to the encroachment of a mass of shale abutting on the main reef a large number of claims on the west side of the mine have recently been abandoned, so that at the end of 1885 the number of assessed claims was only 886; a line of floating reef extended also along the eastern boundary of the mine, striking thence across to the opposite side, so as to shut off about one-fourth of the claims to the north from the deeper workings in the centre and south-east portion of the mine. The bulk of this northern block of claims is still unworked. A recent fall of main reef has covered the southern line of claims to a distance of 50 yards from the edge of the mine, so that within the central area left unencumbered the deepening of the mine is proceeding rather rapidly. The deepest workings at the end of 1885 were nearly 300 feet below the surface, the mean depth of the mine being over 200 feet. No underground workings have as yet been commenced, so that to a casual observer the Bultfontein mine presents to-day a better idea of what the operations of the last ten years have been like than any of the other three mines. For this reason it has been selected to furnish a model of diamond mining for the Indian and Colonial Exhibition. No attempt has been made to deal with the reef-question in Bultfontein, though a good deal of the central floating shale has been removed by individual claim-holders. The incasing rock beneath the sand is a calcareous shale, followed by a

stratum of black rock, as yet undefined. It is not known whether the hard igneous rock occurs below this, but, assuming it does, the cost of cutting down the encasing shale to a safe angle to allow an indefinite extension of open-mine working would probably exceed £3,000,000. It is therefore likely that some cheap system of underground works will have to be devised for the future excavation of this mine. Its present contents, as excavated, is about $6\frac{3}{4}$ million cubic yards, representing a yield of some £5,000,000 worth of diamonds, since the opening of the mine to date. The acreage of assessed claim ground is $18\frac{1}{4}$ acres. The size of a claim in Bultfontein and Du Toit's Pan is rather smaller than in the other two mines, being only 30 feet × 30 feet, or 100 square yards.

The profits realized in Bultfontein and Du Toit's Pan are much smaller than in the Vooruitzigt mines, owing to the inferior quality of the ground. The following abridged profit and loss account will convey an idea of the expense and results of working the best Bultfontein ground; being for the six months ended 30th June, 1885:—

Dr.				Cr.			
To wages, salaries, explosives, &c.	£20,716	12	4	By diamonds sold and on land	£36,256	5	3
,, Forage and stable acct.,	1,528	0	1	,, Blue ground sold	1,209	2	3
,, Water and fuel ..	5,830	0	5	,, Increase of "blue" on floors: 16,437 loads at 2s. 6d.	2,054	12	6
,, Machinery—maintenance and stores ..	3,342	10	6	,, Rent of certain claims	313	7	9
,, General expenses, licenses, &c... ..	2,087	18	10				
,, Decrease of lumps on floor	34	8	0				
,, Balance of profit ..	6,293	17	7				
	£39,833	7	9		£39,833	7	9

The above expenses represent the cost of excavating from the mine and delivering on the depositing floor 136,409 loads of blue ground, also of extracting the diamonds from 107,465 loads of blue passed through the washing machines, which together with the proceeds of 17,615 loads of "Lumps" washed, yielded 35,835 carats, or an average of ·3335 carat per load, equivalent to *six shillings and five-pence per load*, the diamonds having averaged 19s. 2d. per carat all round. The cost of manipulating the ground, all charges included, was *four shillings and sixpence per load* (of 16 cubic feet). The Company in question possesses 72 claims, of which 50 are in the centre and 22 on the margin of the mine. From this latter block over 30,000 loads of floating reef were removed at a cost of 2s. per load. The ground washed was all taken from the centre block, which are about the richest in the whole mine, so that the profit made out of these central claims was at the rate of £250 per claim per year.

The Du Toit's Pan Mine derives its name from the "pan" or small lake which lies to the southward of it, at a distance of some

600 yards, and about equi-distant from the Bultfontein mine. The Pan is filled by the surface drainage which gravitates there after heavy rains, and it has frequently been 50 or 60 acres in extent, when pleasure-boating and wild duck shooting may be had there. At the present time, owing to the continuous drought, the Pan is quite empty of water, and the same is the state of Blankenberg's Vley, a similar but smaller lake lying about a mile and a quarter to the north-east of Du Toit's Pan Mine. The water of both these "pans" is leased by the diggers for mining purposes, twelve companies from the two mines forming what is called the Pan Pumping Association, whilst Blankenberg's Vley is leased by three Du Toit's Pan Companies. The rental is drawn by the London and South African Exploration Company, Limited, who possess not only the two farms of Bultfontein and Dorstfontein, on which the two mines are situated, but also the adjoining farm to the southward of Alexandersfontein, on which are laid out a great portion of the depositing sites for the Bultfontein mine. The southern boundary line of Bultfontein farm touches the southern margin of Bultfontein mine, the eastern boundary of the farm almost touching the western extremity of Du Toit's Pan, whilst the northern boundary line of Bultfontein farm actually touches the south-east corner of De Beer's mine, whence it runs westward through the centre of the town of Kimberley, the southern half of which, known as the Newton Estate, is built on London and South African Company's property, whilst the northern half of Kimberley township, including Gladstone and De Beer's, lies on the Vooruitzigt Estate of the Government. The Exploration Company likewise owns the site of the town of Beaconsfield, which is built on the north-west of the Bultfontein and Du Toit's Pan mines, and is rapidly growing to considerable dimensions. Freehold tenure is granted on the Government estate, but the leases on the Bultfontein farm, on which a monthly rental of 10s. per "stand" (measuring 60 by 80 feet) is payable, may any time be cancelled if the site should be required for mining purposes. Great friction has existed on this score between standholders and the Exploration Company, but attempts are being made to amicably settle some of the differences. The Company also receives a monthly rental of 30s. per claim from the two mines on its estate, which rental includes the use of one acre per claim for depositing floors. The Government have hitherto made no charge for floor rent on the Vooruitzigt estate, but a charge of 5s. per acre is now to be levied for the depositing floors of Kimberley and De Beer's mines. This, in addition to the monthly licence of 10s. per claim, will afford a revenue to the Government of some £8,000 per annum, whilst the revenue from the claim licences of Bultfontein and Du Toit's Pan mines, amounts to about £40,000 annually. The London and South African Exploration

Company has proved one of the finest investments in the world; its 10s. shares are worth £7 10s. in the market to-day.

The Du Toit's Pan Mine is in the shape of a half hoop, measuring an average of 200 yards wide and 750 yards long, the greater length being from east to west. The number of assessed claims at the end of 1885 was 1,430, equal to 30 statute acres. The greatest depth attained in the open workings was about 295 feet, but one of the Companies situated near the centre of the mine on the northern side has sunk a shaft in its claims to a depth of some 500 feet, and the finds from this level are said to be much more satisfactory than nearer the surface. This is the only instance of underground working at present carried on in Du Toit's Pan, it being the general impression that, owing to its small average yield of diamonds, Du Toit's Pan, as a mine, will not pay to work underground. Further experience, however, may prove this view to be erroneous. The present average depth of the whole mine is only about 165 feet, there being still many high banks of floating reef and unpayable ground that have been left standing at near their original level. Some of the claims at the western extremity are encumbered by a fall of main reef which there seems no inclination of removing at present, though the ground below is known to be some of the richest in the mine. The encasing rocks (or reef) of the mine are similar to those described in Bultfontein; a yellow shale on top, followed by a black shale of yet undefined depth. In both these mines the modern workings have been much hindered by the accumulation of "debris" left from the early days of dry sorting. The total excavation of Du Toit's Pan Mine measures some 8 million cubic yards, representing a gross yield of about £5,800,000 worth of diamonds.

The following abridged Profit and Loss Account shows the results of a company working 43 claims on the southern reef during the period ended 31st December, 1885:—

Dr.				Cr.			
To wages, salary, &c. ..	£10,079	1	4	By diamonds sold ..	£17,672	10	0
,, Forage and stable, &c.	869	6	4	,, Increase of Blue on Floor, 27,092 loads 3s.	4,063	16	0
,, Fuel and water ..	1,946	2	11				
,, Explosives	1,030	2	3				
,, Maintenance and stores	876	6	7				
,, General expenses ..	1,171	18	3				
,, Balance of profit ..	5,763	8	4				
	£21,736	6	0		£21,736	6	0

The above represents the cost of excavating and depositing on the floor 80,488 loads of blue ground, also of hauling out 1,902 loads of reef, besides washing 53,396 loads of blue, which yielded 13,931 carats of diamonds equivalent to 26 carats per load averaging 25s. 4½d. per carat, or *six shillings and sevenpence half-penny*

per load. The total cost of manipulating the ground was *four shillings and sevenpence half-penny* per load, leaving a profit equal to £268 per claim per year. This is a most favourable instance of Du Toit's Pan working, the average results from the whole mine being not half so good as the above. Du Toit's Pan yields the largest and most valuable diamonds of any of the four mines, though in average value per load it stands last of the four.

The largest diamond ever found in Griqualand West was discovered near the west end of Du Toit's Pan Mine on the 29th September, 1885. It was a large irregular octahedron stone, slightly spotted, of yellow colour, and weighed 404 carats or nearly 3 ounces. In the month of February previous, a similar stone of 352 carats was found near the east end of the mine. The former of these stones is probably the largest diamond the world has yet produced, excepting a very imperfect stone of some 500 carats found in Jagersfontein in the year 1881.

The largest diamond ever found in Bultfontein was one weighing a little over 150 carats discovered in the north-east corner of the mine in the latter part of 1884. The average size of diamonds found in Bultfontein is smaller than in any of the other three mines, though the colour of Bultfontein stones is superior to the rest. Experts can generally tell, on inspecting any rough diamond, from which of the four mines it has come ; and the River diamonds again are distinct in character from those of the Kimberley mines. Quite recently the special court for the trial of contraventions of the Diamond Trade Act, was enabled to convict some River diggers of being in unlawful possession of diamonds, on the evidence of experts who unhesitatingly declared the stones produced could not possibly have come from the River diggings.

The most serious obstacle to the profitable working of the Cape mines is the large illicit traffic in diamonds that continues to be carried on, in spite of the stringent penal laws and the elaborate searching system in vogue for its suppression.

It is estimated that from *one-fourth* to *one-fifth* of all the diamonds found in the mines never reach their lawful owners, and with an annual production exceeding two millions sterling, the importance of suppressing this nefarious traffic can hardly be exaggerated.

In conclusion, it may be interesting to quote some figures of the gross production. Prior to 1st September, 1882, when the Diamond Trade Act came into force in Griqualand West, no accurate official returns were made of the exact weight and value of diamonds produced in the several mines, but since that date careful monthly statistics are collected by the chief of the Detective Department at Kimberley, with whom, under penalty, every digger is bound to register exact particulars of his monthly finds.

The following is an abstract of these returns up to the end of December, 1885 :—

		Kimberley.	De Beer's.	Bultfontein.	Dutoitspan.	Total Production of the Four Mines.	Total Import into Kimberley.	Total Exports from Kimberley.
1882. Sept. to Dec.	Production in Carats	380955¼	140513½	143936½	190948⅛	856353⅜	...	796546⅝
	Value ... ... £	456420	157220	192530	313040	1119210	...	1156273
	Average per Carat ...	23/11½	22/4½	26/9	32/9½	26/2	...	29/-
1883. Jan. to Dec.	Production in Carats	947817⅜	426728½	502029¾	435658½	2312234⅛	...	2413953⅜
	Value ... ... £	846705	435762	503227	573772	2359466	...	2742521
	Average per Carat ...	17/10¼	20/5	20/0½	26/4	20/6	...	22/8⅝
1884. Jan. to Dec.	Production in Carats	642438	497596¼	566201¾	498550½	2204786½	...	2263686⅝
	Value ... .. £	634332	579608	588465	760218	2567623	...	2807288
	Average per Carat ...	19/9	23/3½	20/9½	30/5¾	23/1	...	24/9⅜
1885. Jan. to Dec.	Production in Carats	523774½	566233¾	636340¼	560912½	2287261	...	2440788⅛
	Value ... ... £	458858	500134	579326	690360	2228678	...	2492755
	Average per Carat ...	17/6¼	17/8	18/2½	24/7¼	19/6	...	20/5
Total— 3⅛ Years.	Production in Carats	2494985⅛	1631072	1848508¼	1686069⅝	7660635	272305⅛	7914974¾
	Value .. ... £	2396315	1672724	1863548	2337390	8269977	436876	9198837
	Average per Carat ...	19/3	20/6	20/2	27/9	21/7½	32/-	23/2

Shewing a total production from the four mines for the three and a third years of over 8¼ millions sterling. The imports into Kimberley are made up of 123,847⅝ carats from the Free State Mines (mainly Jagersfontein), valued by the importers at £193,717; 68,245⅛ carats from the River Diggings, valued at £157,884; and 80,212⅜ carats from England, the Cape Colony, etc. (diamonds returned for sale in the Kimberley market), and valued at £84,475.

It will be noted that the prices realized in 1883 shew a great falling-off from those of the previous year—also that in 1884 a considerable revival occurred, whilst in 1885 prices ruled lower than in any of the preceding years.

It is further interesting to note that whilst Du Toit's Pan stuff always fetches a much higher price per carat than diamonds from the other mines, the relative value per carat of diamonds from the other three mines fluctuates constantly.

The weight of diamonds sent through the Kimberley Post Office in 1884 was 1,801 lbs. (gross), and in 1885 it was 1,830 lbs. Forty per cent. must be deducted from these weights for weight of packages, leaving respectively 1,080 lbs. and 1,100 lbs. as the net weight of diamonds shipped each year, equivalent to 2,385,000 and 2,430,000 weight in carats, so that it will be seen, by reference to above table, that the Post Office Returns agree very nearly with those of the Detective Department.

From a comparison of various official sources of information it has been estimated that the gross value of diamonds exported from the Cape Colony up to the end of 1885 amounted to £35,000,000. But this estimate does not include exports on the person prior to the existence of an export duty, nor the large number of stolen diamonds known to be illicitly exported.

By calculation of the amount of diamondiferous ground removed from each of the four mines to date, and from the known average yield per load in each, it is found that not less than 33 million carats of diamonds (*or more than* 6½ *tons weight*) must have been extracted from the four mines up to the present time, realizing in round numbers *forty millions sterling*.

The total number of claims in the four mines is at present 3,238, or about 70 acres of diamondiferous ground. Its present assessed value is £5,172,975, being at the rate of £75,000 per acre.

This property is divided amongst 98 holders, of whom 42 are Joint Stock Companies and the remaining 56 private firms and individuals. The gross capital of the above 42 companies, holding 2,211 claims, is £7,970,490.

Taking the property of the 56 private holders in the same proportion to the assessed value of their claims as is obtained from the above capital of the companies, the value of private property in the four mines would stand at £1,624,900, making the gross capital of the entire mines £9,595,390.

Within the last few months a syndicate has been formed in London, under the title of the "Unified Diamond Mines, Limited," for the object of bringing about an amalgamation of all the holdings in the several Kimberley Mines, and taking such other steps as may tend to regulate production and keep up prices. The capital of the Unified Company is to be ten millions sterling, and if established it is likely to prove one of the most powerful commercial monopolies in the world.

The amount of labour and machinery employed at the Diamond Fields is of course considerable. Something like 10,000 native labourers and 1,200 European overseers and artizans are daily at work in and about the four mines, the average wage earned by a Kafir being about 20s. per week and by a white man £5 per week.

The population of the Fields at the time of the last Census, taken in 1877, was as follows :—

	Europeans.	Others.	Total.
Kimberley and De Beer's . .	6,486	7,104	13,190
Bultfontein and Dutoitspan . .	1,648	2,611	4,259
			17,449

At the present time, however, owing to the increased activity in working the mines of Bultfontein and Dutoitspan, the population around the latter has more than doubled.

In addition to the above manual labour some 2,500 horses, mules and oxen are daily employed about the mines.

The total length of tramways is about 160 miles.

About 350 steam engines, at work and idle, are fixed around the four mines, aggregating nearly 4,000 nominal horse power.

The annual expenditure in labour, material, &c., is not less than two millions sterling, distributed somewhat as follows :—

Wages, Salaries, etc.	£1,000,000
Fuel and Water	250,000
Mining Material and Stores	250,000
Explosives	100,000
Forage and Stable Expenses	125,000
Rates and Taxes, General Expenses, &c. . .	275,000
	£2,000,000

THE RIVER DIGGINGS.

Diamonds have been found in the bed, and on the banks of the Vaal River from its junction with the Orange in latitude 28° 20′, longitude 24° 30′, to above Christiana, latitude 28°, longitude 26° 30′. The River Diggings are situated between these two points on both banks of the Vaal, those at present worked extending from Delport's Hope at the junction of the Harts and Vaal Rivers to above Hebron on the latter stream, a distance of some fifty miles across country, or about seventy miles following the winding of the river.

The farms traversed by this length of river are partly private property, partly Crown lands. In the former case a distinction is drawn between lands on which the Crown reserves the right to precious stones and minerals, and lands on which there is no such reservation. Within the latter category falls the "Pniel Estate," owned by the Berlin Missionary Society, and also the "Vaal River Estate," the property of some Kimberley capitalists. Both these farms are on the south bank of the river, opposite and below the town of Barkly which is on the north bank.

The rising ground above the river at Barkly undulates into a

number of hills containing diggings known as Colesberg Kopje, Magazine Kopje, etc., and indeed it is next to impossible to give a complete list of all the fanciful names which diggers have bestowed on the numberless hills or "Kopjes" through which the Vaal River cuts its way from Christiana to Delport's. Noteworthy, however, is the circumstance that when a digging occurs on one bank of the river the "Kopje" on the opposite bank is pretty certain to be found diamondiferous also. Thus Pniel diggings are immediately opposite Barkly, Webster's opposite Good Hope, Cawood's opposite Gong-Gong, Waldek's opposite Union Kopje, and so on.

The River diggings are all in alluvial soil, a heavy deposit of ferruginous gravel mixed with red sand, lime and boulders, that has been washed into the crevices of the rocks by the action of water. Whether the diamonds which this heavy deposit contains have been formed in situ, or whether they were brought from a distance, is still a vexed question. The balance of evidence is in favour of the former hypothesis. A large number of the river diamonds when unearthed are found coated with oxide of iron, which, in the case of cracked stones, has penetrated inside the cracks of the diamonds. Some French geologists have argued that the Drakensberg is the home of the diamonds, but in that case it is hard to conceive why none of the other rivers taking their rise in those mountains should have brought down diamonds, and why, even if the Vaal could be supposed to have got the monopoly of them, few diamonds should be found nearer its source than Christiana, or much below its junction with the Harts at Delport's. It will be seen from above table that the Vaal is being worked for diamonds along a length of banks extending over seventy miles. Within these limits, however, there is a stretch of half that distance, between Hebron and Barkly, where next to no digging is carried on. Indeed, the area of banks and river bed, that may be considered diamondiferous, is perfectly undefined, the diggers having shifted about from spot to spot, opening up a digging only to abandon it as worthless and then perhaps after several years returning to work it with profit. The size of a "claim" varies in different mines. At the River diggings it was originally thirty feet square, or nine hundred square feet, but in the latter part of 1882, owing to the falling-off of population at the alluvial diggings, Government increased the size of a claim to double that area, so that it now measures sixty feet by thirty. On Crown lands the Government of course retains the whole of the licence money. On private property where the Crown has the reservation of precious stones, the licence moneys are divided equally between the Government and the proprietor, whilst on private property where there is no such reservation, the proprietor is at liberty to

fix the amount of licence money, rent, or royalty to be paid by diggers, subject to a contribution to the Government of ten per cent. of such revenue.

The present revenue collected from the alluvial diggings is at the rate of about £1,500 per annum, of which about £1,000 flows into the Government coffers, and the remainder to the proprietors.

From the statistics published by the Board for the Protection of Mining Interests, it appears that in the three years ended 31st August, 1885, the river diggings produced 55,514 carats of diamonds, valued at £132,042, equivalent to 47s. 6d. per carat. This valuation is probably excessive, but, after making every allowance, the superior quality of river stones will still be very apparent. Within the same period the total exportation of diamonds from the entire province amounted to 7,011,382 carats, valued at £8,292,870, or 23s. 6d. per carat; or, in other words, whilst the weight of diamonds from the Vaal River was only about $\frac{1}{125}$ of the entire exports, their declared value was as much as $\frac{1}{62}$ of the total value exported.

There is no means of arriving at an approximate estimate of the gross yield of diamonds from the river diggings since their opening fifteen years ago. But comparing what imperfect statistics are available, it is probable that the total yield of diamonds from the Vaal River to date has exceeded £2,000,000.

A short account of the mode of working at the River diggings will not be out of place here.

It has been stated above that the diamondiferous deposit is embedded between boulders, and mixed with a quantity of fine red sand, and in many places with a good deal of lime. The diggers draw a distinction between "red kopjes" and "lime kopjes." At some of the diggings this lime forms a hard crust, or "clinker layer," on the surface, varying in thickness from two to twenty feet, and shafts are sunk through it before the payable ground is got at. At Gong-Gong some of these shafts are over a hundred feet deep before they strike the bed-rock, which is a dolerite of amygdaloidal structure. At other diggings the workings are exceedingly shallow, consisting only of a few inches of red sand before the bed-rock is reached. The hardest work consists in excavating and lifting the heavy boulders, under which the richest gravel is generally found. At the present time a large number of the claims are encumbered with debris from the early workings, which has to be removed before the maiden ground can be dug. Another difficulty is the presence of water at a depth of forty or fifty feet at Gong-Gong and Waldek's, the majority of diggers not having the capital for putting down pumps. Occasionally, too, the river rises and submerges claims, which are then subject to a reduced rental of only one shilling per month whilst under water, the

ordinary rental being ten shillings. There is little doubt that the river bed itself is rich in diamonds, but the Vaal is too well supplied with water all the year round to render prospecting of its bed an easy matter with the limited funds and appliances at the diggers' disposal. In a time of drought, some four years ago, a narrow arm of the river at Niekerk's Rush was diverted, and diamonds to the value of £30,000 taken out of the bed. The Vaal has continually changed its course, and occasionally a digger is lucky enough to strike a portion of an old river bed, silted up with lime and gravel, when his finds are sure to be good. There are evidences along the whole banks of a vast denudation; rocks on the summits of the hills, more than a hundred feet above the river level, are water-worn, with the marks of great eddies in their sides.

The proportion of diamondiferous gravel varies at different diggings. In four loads of solid ground there is on an average one load of boulders, one load of rough stones, one load of fine sand, and finally one load of pebbles which remains to be washed. This is in the red sand kopjes. In the lime kopjes there are less boulders, but more calcareous sand and gravel. The mode of working is as follows:—

After the excavation has been made with pick and shovel (there is seldom any explosive used) the boulders and large stones are thrown aside, and the gravel secured is taken to a sifting-machine, styled a "Baby." This consists of an oblong sieve swinging by four thongs or chains from four upright poles, and inclined slightly, so that the pebbles may roll over it. At the higher, or feeding end, a small square sieve, about two feet square, and coarse enough for stones three-eighths of an inch thick to pass through it, is fixed over the oblong sieve, which is about five feet long and of very fine mesh. The gravel from the claim is emptied by hand buckets on to the coarse sieve; the worker, standing behind it, swings it alternately towards and away from him, whereby the finer stuff passes through on to the lower long sieve, which again allows only the fine sand to pass through, whilst the pebbles roll off the lower end into a tub put to receive them. The coarse stones from the top sieve, as well as the fine sand which passes through the lower one, are refuse to be thrown away, but the medium-sized pebbles which have tumbled into the tub will contain the diamonds, if there are any in the ground. Any diamonds too large to have passed the first sieve would have been noticed at once by the worker, who has it immediately under his eye, and who continually throws out the rough stones to make room for fresh ground from the claim, whilst any diamond so small as to have passed away with the fine sand is not worth the trouble of further search. This is the "dry-sorting" process.

The process that follows consists in "gravitating" the contents

of the tub, so as to separate all the heavier pebbles, including the diamonds, from the light soil and stones. This may be done by hand, if the operator is skilful. A small round sieve of medium mesh is used for this purpose, and into it is emptied a bucketful of the pebbles from the "baby." The workman, bending over a tub of water and holding the sieve in both hands, immerses it just below the surface and gives it a succession of sharp twists, pulsating it gently in the water so as to let the light stuff come to the top; then, when he is satisfied that the heavier contents have been separated from the lighter stones, he deftly turns over the sieve on to a flat board, termed a "sorting table," when, if he has managed successfully, all the heavy pebbles will appear on the surface of the mould and any diamonds there will at once be visible. To guard against the risk of losing any he dissects the mould with a little sorting-knife of thin wedge-shaped iron, scraping off the top layer of pebbles first, till the bottom of the mould is reached and the whole of it brushed off on to the ground to make room for the next sieveful. An experienced digger can tell at a glance, from the appearance of the deposit, what chance there is of finding well in it. He knows by sight the heaviest stones that occur in diamond-bearing ground, and their presence is a sure sign of diamonds being there too. This is particularly so of a curiously marked pebble that is streaked with a succession of parallel rings, from which it has received the descriptive name of "banddoom" (band-round). The specific gravity of the "banddoom" is almost identical with that of the diamond, and where the former is found experience has taught the latter may be confidently expected. Beautiful agates are also found in this deposit, as well as quartz-crystals, jaspers, calcedony, but few garnets, and no iron-pyrites, or carbon, which occur so plentifully in the Kimberley mines. An assortment of "river stones" forms a very pretty collection, and it is conceivable enough that, prior to the opening of the diggings, diamonds should have been picked up by children of the natives and valued as more than ordinarily pretty pebbles, which would account for their being carried about and some left in the district of Hope Town, where Mr. O'Reilly first discovered them.

In the earlier days of the diggings the value of gravitating was not understood. The excavated ground was washed in a "cradle," consisting of a tier of two or three square sieves on a pair of rockers; the top sieve, being the coarser, retained the larger stones, whilst the mud and sand passed through the lower fine sieve, leaving the clean pebbles and diamonds in the latter. The invention of the "baby" derives its name neither from its association with the "cradle," nor from its swinging motion suggestive of infancy, but from its inventor, an American named Babe, who was digging at the river about 1870. The rotary washing machine in use at

Kimberley, has been tried at the river, and though not so satisfactory as gravitating, it answers fairly well.

Some six years ago a machine was devised to save the labour of hand-sieving and supersede the imperfect washing of the "cradle." This contrivance, known as the "Rule and Henry" or "Maddocks" machine, is an arrangement of suitable mechanism for "jigging" a sieve up and down whilst immersed in a tank of water, and providing proper shoots for separating the heavy deposit from the tailings.

The average quantity of maiden-ground that one man can excavate per day is about one and a half loads of rough gravel and sand, which after being "babied," yield half a load of pebbles to be washed. The cost of picking, sifting, and washing is about two shillings and sixpence per load (of 22½ cubic feet) of maiden-ground.

No estimate whatever can be framed of the average yield of diamonds, their occurrence being too uncertain. Sometimes hundreds of loads are manipulated without finding a single precious stone, then perhaps a rich "pocket" is hit upon and a handful of diamonds are turned out. Still, with all this uncertainty to an individual digger, the gross yield of diamonds from the river remains pretty uniform throughout the year, being at the present time at the rate of about £4,000 worth per month, which is very near the average of the last three years. This represents the finds of not more than 350 diggers distributed over the various diggings from Jonas' to Delport's, of which number about 300 are Europeans and 50 Kafir-diggers, besides some 500 native labourers.

It will thus be seen that diamond digging on the Vaal is not a very lucrative occupation, bringing in on an average an income of about £120 per annum. The expenses that have to be paid out of this are not very heavy, and living is cheap; the life itself healthy and certainly preferable to that of artizans in the Kimberley Mines. At some spots, such as Pniel, Gong-Gong and Hebron, there is a pleasant profusion of foliage, and the mud-huts and tents of the diggers are picturesquely pitched amongst the trees on the hill-sides overlooking the river, whilst here and there a rustic arbour, with dining table and wooden benches, may be seen hidden in the leafy shade. But the majority of the diggings are bleak stone-kopjes, where there is nothing but the fresh air, wide view and free life to compensate for an arduous existence, though to these inducements must, of course, be added the fascination of the pursuit that still draws men from all quarters of the globe, so that on a single small digging there may be nearly as many nationalities as workers. Genial, hearty fellows the most of them are, and not wanting in tastes not usually associated with remote mining camps. Books are here in plenty, and the author of "Culture and

Anarchy" would probably be pleased to hear of his works reaching this distant outpost of civilisation.

There is no diamond-market at the river diggings, and as the expense of frequent visits to Kimberley would absorb a large part of the digger's earnings, one or more of the Kimberley diamond-buyers takes a weekly trip to the Vaal, making the tour of the several camps where work at the time happens to be chiefly carried on.

The most actively worked diggings at the present moment (January, 1886,) are Barkly, Delport's, Longland's, Niekerk's, Waldek's and Hebron, besides the newly opened alluvial digging at Jonas Kopje, which are situated a mile back from the river, six miles above Hebron. The diggings here, though shallow, consisting only of two or three feet of red deposit, are turning out well.

During the speculation mania of 1881, companies were formed for working the diggings at Gong-Gong and Waldek's Plant, but as no method was employed for operating on a large scale, the undertakings soon collapsed. It is not at all unlikely, however, that a properly matured scheme for extensive operations might meet with success. At the present time there is as much debris-washing going on as mining in maiden-ground, and the finds in the former are said to pay better to small diggers, as there is no excavation to be done, and the very imperfect washing and sorting of the early days has left plenty of diamonds still amongst the pebbles; besides, the debris is mostly close to the margin of the river, whilst the unworked maiden-ground is, perhaps, half a mile away, and necessitates carrying water that distance, or else bringing the ground down to the banks. Most interesting are the workings at Waldek's Plant, where a deep gully has been excavated over a mile long, varying in width and depth from twenty to seventy feet. The ground from this gully is hauled to the surface by windlass and bucket, running on an inclined wire-rope, after the style originally adopted in Kimberley mine, and bears a great resemblance to the Kimberley "yellow ground," whilst the containing rock forms a wall of reef on either side of the gully, and is basaltic, like the river bed and the lower rocks at Kimberley.

The largest diamond found on the Vaal River, known as the "Spalding" or "Stewart" diamond, was discovered at Waldek's in November, 1872. It weighed 288 carats, and was valued then at £5,000. It has since been cut and weighs now 128 carats, being owned by Messrs. Pittar Leverson, of London. In 1881 a perfect yellow stone of 148½ carats was found at Gong-Gong by Mr. Dowling, and in January, 1885, a native digger at Keiskamma found a similar diamond of 147½ carats, each of these stones having been sold on the spot at the same price, viz., £600.

LAND AND AGRICULTURAL AND PASTORAL RESOURCES.

The Colony, in its varied aspects and conditions, gives scope for every kind of pastoral and agricultural occupation. Flocks of sheep and goats, and herds of cattle and horses, feed entirely on the natural plants and grasses; wheat and other varieties of grain yield excellent returns from the soil; and most of the products of the temperate or semi-tropical zone may with moderate ease and trouble be successfully cultivated. Farming at the Cape is accordingly, in judicious and industrious hands, a profitable as well as an independent employment.

It should be understood, however, by persons desirous of pushing their fortunes in this direction, that an initiation into the colonial peculiarities of seasons, soil, pasture, management of stock, and, it may be added, native labour, as well as the vernacular Cape Dutch, the spoken language of a large portion of the country population, will be of essential service. A short time spent in observing and getting accustomed to colonial ways is amply repaid by the experience gained.

The value of any farm in the Colony depends much upon the quality of its herbage, the strength and permanency of its fountains, the nature of the improvements that have been made upon it in the form of dams, buildings, homestead, &c., as well as its extent of arable land, and proximity to a market. The best first-class farms, combining "horn, corn, wool, and wine," are worth at present from £3 to £1 a morgen, and others range from that price down to 10s. per morgen, while inferior spots may be had as low as 1s. or 1s. 6d. per morgen, or two acres. In some districts, however, such as the fertile irrigable lands of Oudtshoorn, fractions of farms sometimes sell at the rate of from £50 to £250 an acre.

Although the greater portion of the country is settled, and become the property of private individuals, there is a large extent of waste land belonging to the Crown, which is from time to time surveyed and offered for sale by public auction and disposed of on perpetual quit-rent (equivalent to an annual rental) for the highest annual sum obtainable. If such land offered at public auction fails to obtain a purchaser at the price reserved, any person prepared to fulfil all conditions required may, upon application within one year from the date of the sale, become the purchaser of the ground at the upset price.

This is provided for by Acts 14 of 1878, and 37 of 1882, which form the present land law of the Colony. Each lot is put

up at an upset annual quit-rent, which is one-twentieth part of the actual assessed value of the land, and the highest bidder who offers not less than such upset quit-rent is declared the purchaser of the lot on quit-rent, dating from the day of sale; and every such purchaser is bound to pay the first year's quit-rent in advance on that day, and to secure the payment for the two next years by sureties whom the Civil Commissioner shall deem sufficient: provided that the Civil Commissioner shall, if required by the purchaser, receive two years' rent in advance, in which event the said security is not required. The expenses of survey and erection of beacons and the expenses of title deed (viz.: stamp according to tariff, and the office fee of 12s. 3d.) are paid on the day of sale. Upon due payments being made, and surety bond (if required) passed as above, the purchaser becomes entitled to receive title deed on quit-rent to the said land, which is issued to him accordingly. The annual quit-rent payable upon any quit-rent grant, whether a grant made after the taking effect of the said Act No. 14 of 1878, or upon any grant made previously, may be redeemed at any time by the payment of a sum equal to not less than twenty times such annual quit-rent, which redemption in no way alters the nature of the tenure.

The disposal of small areas for agricultural purposes is provided for by Act 37 of 1882, amended by Act 40 of 1885. This bids fair to become a most popular means of acquiring small holdings, its advantages being appreciated by Europeans and Natives alike. The following is a synopsis of its provisions:—

Grants of available waste Crown land not exceeding 250 nor less than 4 morgen in extent, and not being forest land, may be made to approved applicants upon perpetual quit-rent under conditions as follows:

The applicant, who must address the Civil Commissioner of the division in which the land he applies for is situated, must declare that he is 21 years of age or upwards, that he is not the owner of ground of 250 morgen or upwards, that he applies for the land for his own use and benefit, that he is not in collusion with other persons respecting the application, and that he does not already hold land under the Act. The land must already have been surveyed, and he must either describe it accurately or generally so as to lead to its identification. When applying he must deposit with the Civil Commissioner a sum equal to 1s. per morgen, which goes in diminution of the first year's payment, or otherwise if the application be refused, is returned. The application, if in order, is referred to a Land Board consisting of three persons of whom the Civil Commissioner is one *ex-officio*, specially appointed for each division; which Board reports to the Commissioner of Crown Lands and Public Works.

An approved applicant receives a licence to occupy for five years, dating from the 1st July or 1st January following the date of the

licence, for a yearly fee equal to one-twentieth of the price fixed for the land. Within six months he must personally reside upon his ground, and within two years must either enclose or bring under cultivation a twentieth part of the holding;—failure to act upon these conditions rendering him liable to forfeiture. Power is given to enter upon the land at any time and inspect the improvements. Upon the expiration of the period of licence and completion of all conditions, upon the certificate of the Commissioner of Crown Lands and Public Works, quit-rent title may be issued under the provisions of Act No. 14 of 1878, the quit-rent being the same as the licence fee.

Owing to the excellent capabilities of the available ground in the part of the Colony commonly known as Kaffraria, where small holdings have been so successfully worked by immigrants, the already surveyed four-acre allotments in that locality are now available for the purposes of the Act, and applications are at present being received for them. Where more than one allotment exists, they may be grouped together for the purposes of a single licence, provided one compact lot can be made of them, personal occupation being a chief feature of the licence.

Much trouble, delay, and inconvenience having been experienced in subdividing and transferring land, on account of the existence of title-deeds and deeds of transfers (mostly of old dates) which were based on erroneous diagrams, an Act was passed in 1879 for facilitating the obtaining, at a very trifling cost, amended registry of such properties, based on diagrams correctly representing the land as defined by beacons agreed to by all concerned. This Act is working very satisfactorily, and the number of applications for amended titles under its provisions is greatly on the increase.

The portions of the Colony most favourably situated for Agriculture are those regularly visited by copious rains, and where artificial irrigation is unnecessary. The coast districts, especially those contiguous to Cape Town, possess this advantage, and, as has already been stated, form the principal granary of the Colony.

The Cape division (the grain-growing portion of which is called the Koeberg), being situated nearest the metropolis, is naturally the most advanced in cultivation and the oldest settled portion; the rental, or purchase price of land is also higher, and the individual holdings smaller. There are some good old families settled here and there, who still own three to four thousand acres of land, but the greater number of farms range from 200 to 2,000 acres.

Oathay and wheat are the great staples of this district; its nearness to the large market of Cape Town enables growers to carry their produce to market by their own waggons, the hay in sheaves, as it comes from the land. The oats intended for hay are sown thickly and cut down just as they begin to show signs of ripening, and while the sap or juice is still in the stalk. The hay

or oatsheaves so made form a sweet and wholesome fodder for horses and cattle, which fetches, if fair or good quality, from 3s. to 6s. or 7s. per 100 lbs. weight, according to season and demand.

Barley is very prolific; the Cape barley more so than English malting kinds; but it requires well manured virgin soil. The actual return on two farms which could be named was three hundred and thirty bushels from three; the average return is about forty bushels per acre; and it realises about from nine to fifteen shillings per bag of three bushels. Rye is not so largely cultivated as other cereals; it is generally used for horse feed and the straw for thatching purposes; it yields largely and requires the lightest and most sandy soil.

In the Cape and Malmesbury districts, some of our best wheat is grown, which would gladden the heart of an English corn chandler or miller, weighing from 200 to 212 lbs. per muid of three bushels, which is at the rate of 67 to 70 lbs. per bushel; and it certainly seems strange that with thousands upon thousands of acres of ground equally adapted to the growth of wheat, but still lying uncultivated, we should be importing £300,000 to £600,000 value of breadstuffs yearly to supply our own wants, of which undoubtedly every bushel could and ought to be grown in the Colony.

Some people are sanguine enough to think that we ought to export, but whilst there is such a wide range between the price of wheat in the Colony, and that obtained by the farmers of Australia or America, to stand all the charges and risk consequent on bringing it over sea four thousand or six thousand miles, the solution of that problem may be left for the future. To the above charges must be added an import duty of 1s. per 100lbs., which, in all, really means a protection to the Cape farmer of 25 per cent. to 33 per cent., according to price and season. And this with a climate and soil specially adapted to the growth of wheat, where the yield (even with the present mode of culture) shows a good average for the acreage ploughed and quantity sown; with labour at least equally cheap and obtainable as it is in the countries competing with us in our own markets; and the price of good ground from £1 to £2 per acre, and that sometimes including a fairly built homestead. When, in addition to all this, we remember that the crops here are subject to fewer drawbacks, all things considered, than most countries have to contend against, it surely is only the want of a knowledge of these facts, that keeps many of the struggling agricultural farmers of Europe (if with a family so much the better) from trying their fortune here. There is no doubt that we have ample room, even at this western end of the Colony, within easy distance of the larger markets, for the gradual settlement of thousands of families in the

cultivation of cereals, vines, and sheep-farming. But they must be of the right stamp, with sufficient capital to give them a start, willing to work, and not too proud or self-willed to learn, because the most intelligent man, no matter how experienced, can gain many useful, nay, necessary hints, from local usages, which it is well not to ignore, although they may appear strange or wrong. If the newcomer acts with due caution, and accommodates himself to his surroundings, applying his experience only where he feels sure it would give better results than the system or mode of culture generally followed by his new neighbours, there is not the slightest doubt that the same amount of energy, forethought and capital expended in the Colony, would give far better returns than if employed in older, more developed, and keenly contested centres of agriculture; and this remark equally applies to every branch of industry in the country.

To give the reader, if a stranger, some general idea of the routine followed and the work done on an agricultural farm in the corn-growing districts of the West, let us suppose we are on a farm of 1,000 morgen (2,000 acres) in the Malmesbury district. As we must have a starting point, let us take the 15th to the 30th of April, the time we look for our first rains; and all farmers who are on the alert ought to be ready by the 15th, because if a few earlier showers have given the grass a fair start, the sooner the crops are in the better, so that they may get the benefit of the full rainfall. If no rain has fallen before the 15th April most farmers prefer waiting until the commencement of May, after which they begin to plough in oats and any early crops, although it may prove a dusty operation. In fair seasons, oats are sown from the 20th of April to the 30th of May; wheat from the 15th of May to the 30th of June. In exceptional seasons much later ploughing is done, with good results.

We must not forget the all-important work of manuring. The manure, after being thoroughly worked and taken out of the kraal, is ridden to the lands from about the middle of March, and placed in small heaps, ready to spread out just before ploughing. A good deal of guano is used by some farmers, either alone or mixed with the ordinary farm manure. If used alone about 1 ton of 2,000 lbs. of guano is given to say 3 muids (3 bushels=1 muid) of seed wheat. This guano costs about £6 10s. in Cape Town, and is generally well mixed with sand before being sold. The better qualities cost £10 to £12.

The seed is sown broadcast, and ploughed in (some people think the way this is usually done is open to great improvement) and harrowed afterwards. Howard's and Ransome's single, double, and three-furrow ploughs are generally used, and the two-furrow seem most liked, drawn by eight horses or mules, and attended to by

a ploughman, a driver, and boy or girl to lead the cattle; frequently only one man and a leader. This turn-out is supposed to cover about one and a half acres per day.

An "acre" is generally taken as 300 strides long by 18 wide—divided into two of nine by 300—but as a rule, farmers are not at all particular as to a few yards more or less. About one muid (three bushels) of wheat is sown to nine full "acres" of land, that is one-third of a bushel to each acre. Three muids of oats and one-half of barley are generally sown on the same quantity of land as one muid of wheat, but only half a muid of rye to the land of one muid of wheat. The yield in wheat, according to culture or season, if ten-fold, would be considered poor, fifteen-fold fair, twenty good, and twenty-five to thirty very good. Of course one sometimes hears of 50 and even 100-fold under exceptional circumstances, but we are dealing with practical averages.

Taking eighteen-fold as a low medium, it would give six bushels to the acre, the value of which, in Cape Town, ranges from 16s. 6d. to 22s., without bag, per three bushels (203lbs. gross is generally delivered to millers as the average weight of three bushels). In justice to both climate and soil, it must be remembered that the above result is not the outcome of high-class farming. Manure is scarce and land plentiful.

Mr. John Eaton, of "Droogvlei," in the Malmesbury division, a good farmer of long experience, writing to the *Cape Times* a short time ago, estimates our last five years average yield of wheat per acre at 7½ bushels (and this includes two of the worst years known in the Colony). Mr. Eaton further says, "My experience in grain culture in the Cape Colony, that is in the Malmesbury and Cape districts, is that we only sow half the quantity of wheat per acre that is sown in England." Necessarily, all kinds of grain are sown thin; otherwise, owing to their quick growth under an African sun, if sown too full they are liable to run to straw.

The cost of labour in the ploughing season is for a coloured man per month, about 15s. wages and food, viz., one sheep, say 18s.; one bushel of meal, say 6s. 6d.; 30 salt harders (a mullet about the size of and much like a herring) which cost 10s. to 12s. per 100, or say 4s.; wine three times a day, say 6s. per month—making in all about 50s. per month, with free lodging; which, if for a married man, consists of one or two rooms in an out-house, or if single, some kind of shake-down anywhere; they are not fastidious as to accommodation.

After the ploughing and harrowing are finished, the next operation is to break up new lands or clear them of bush to be ready for ploughing in the succeeding season. The ground is generally covered by a scrub or bush, known as the Rhenoster bush, a pretty sure indication of the suitability of the soil for

cereals. This is cleared by having the bush rolled or grubbed up by the bush pick, and afterwards burnt. The cost of clearing say thirty thousand square yards of the above would be about 40s. The efforts made by farmers to get as much land broken as possible shew that they know the value of this work. They usually take good care of their land and do not exhaust it. After the first year's break-up and ploughing, a wheat crop is raised; in the following year a crop of oats, sometimes it may be another crop, and after that it is allowed to lie fallow.

From the middle of July to September and October, the "veld" or field is in splendid condition; there is a wealth of grass everywhere and flowers of every hue and shade carpet the sward in all directions. Towards the end of October again, it is a most enjoyable treat to drive through these grain-growing districts; for fifty or sixty miles on a stretch the eye resting everywhere on the fast ripening harvest of all shades and stages of growth waving and glittering in the brilliant sunlight.

By the end of October the early crops begin to ripen, and the harvest is soon in full swing, continuing to about the first of December according to season. The crops are reaped by reaping machines, scythes, and sickles. The state of cultivation is not always adapted for machines; the field being too rough, and the roller seldom used, so that the breakage is constant, and the expense of procuring extras considerable. The cradle scythe is largely used for oats, barley, and rye, but the waste is very great with wheat, for which they are in no way adapted; the hot sun during the harvest season causes the straw to become so hard that it is not possible to keep an edge on the blade. A mower receives 2s. 6d. a day with his food and wine. The wheat is sometimes reaped by the sickle. Six reapers, two binders, and two bundle makers, form a team, and go round the country. They take a strip of eight yards and go at it with a will. At times there are as many as seven teams in a field, each divided from the other by a furrow; these teams commence at five in the morning and continue until six in the evening. It would astonish a European labourer to witness their reaping contests. They go at it as merrily as possible, each team straining every nerve to outdo the next one. They cut these eight-yard lands in strips of 60 yards, and the team that finishes his strip first, takes the lead and is called the front team, and so on. It is considered a great achievement to be the first of several teams; they never flag until all is reaped. The harvest home consists of allowing them to have as much wine—the *vin-ordinaire* of the country—as they can hold. Fiddlers are not idle; and powder is given them to enable them to carry out what is known in the vernacular as "shooting the corn off." The day after, they are ready to engage to any who may require their

services; like the mowers, they earn 2s. 6d. per diem, with food and wine.

The scythe and self-delivery reaper are, however, gradually replacing the sickle. The Johnston's Harvester, Walter A. Wood, McGregor's Albion, Hornsby's Indispensable, and McCormack's Daisy are all worked, but the two first are most used in the western districts. All do their work well, and it is surprising Reapers have not met with more ready sale, when we look at the cost and trouble they save. Let us take the cost of a day's harvesting with a Reaper, and the amount of work done in that day. First, a Reaper cuts about two muids or six bushels of seed wheat per ordinary day's run, or eighteen acres. Allow only fifteen days' actual work in the season for a machine; we get 270 acres. Say first cost of Reaper is £32, and deduct 25 per cent. for wear and tear; this gives about 7d. per acre cut. The machine requires a driver, 3s. per day wages; one leader, a boy, in front of cattle, 1s; four binders 2s. 6d. each, 10s; add food for the six at 2s. each, 12s; in harvest each man generally gets wine six times a day (or near two bottles), which at £6 per leaguer comes to, say 2d. per bottle, that is 2s. for wine in the day; and cost of feeding four mules 4s. This gives us £1 12s. as the cost of labour to cut down two muids of seed wheat or eighteen acres of land, equal to 1s. 9d. per acre; add the 7d. for proportion of cost of machine, and a total of 2s. 4d. is reached. If cut by the sickle, allowing one muid or three bushels of seed, as a day's work for each span, as they are called, of eight men and two women or boys, at the same rate of wages and cost of food, gives about 5s. 6d. per acre. The workpeople are supposed to get lodgings, but that does not trouble them much, as little shelter is required at this time of the year. The above operation leaves the sheaves on the land in fair sized heaps, from whence it is ridden to the homestead at the earliest convenience, and stacked until a thrasher can be obtained. About 400 sheaves weighing about 2,200 to 2,500 lbs. may be taken as a load, and four to five muids of wheat or ten muids of oats are expected from each load. Several disastrous fires, sweeping away the labours of a whole year, have taught our farmers the necessity of insuring, or, safer still, getting the grain into store as soon as possible.

Thrashing is the next work on the list. December and January are the principal months in which it is done. There are now a large number of steam-thrashers, mostly Clayton and Shuttleworth's make, competing with each other, and as pre-arranged, the farmer's mules, horses, or cattle fetch the machine and engine from some neighbour's farm, where it is just finished, and no time is lost in setting to work, as all preparation is made for the day they expect to commence. Coals are fetched and boys hired.

The owner, or conductor and engineer, as a rule, undertakes to thrash the stack or stacks, for a given sum, the farmer telling him how many loads it contains, and he, with his practised eye, judging by bulk. This generally averages say £4 or £4 10s. per day for his machine, self and fire-boy. The engineer earns 12s. 6d. to 15s., and the fire-boy 3s. per day. For this they are supposed to find themselves, but when at work, they, as a rule, get food. The farmer provides 15 to 20 men, at 1s. 6d. to 1s. 9d. per day and food, with wine five or six times a day. The engine consumes about 30s. worth of coal per day, if used alone, but where stumps of bush or other wood is obtainable, it will cost less. (Best steam coal can be bought for 43s. to 45s. per ton of 2,240 lbs. in Cape Town).

An 8-horse thrasher (the size generally used) in fair working order, will clean in a day's work, 250 to 300 muids of wheat or 450 to 550 muids of oats. Barley or rye is generally tramped, or if thatching straw is required, the latter is beaten out in bunches by the hand. Tramping means the old-fashioned practice (as described in Scripture) of driving the mules or horses round a circular thrashing-floor, their feet beating out the grain. It is then cleaned by throwing it up against the wind, the heavy grain falling to the ground, the chaff being carried away; but this tedious process is seldom practised now for wheat and oats, or only by the small and poor farmers.

The riding season, or bringing the grain to market, used to occupy three months of the year, but railways have brought them so much nearer, that far less time is now necessary, and the farmer has also a better pick of markets. January and February are the months for this; but some of the well-to-do farmers hold a little to sell, after the ploughing and breaking season, in the hope of participating in any rise that may have taken place.

Formerly a poor harvest insured high prices, but in these days of quick and cheap freight, aided by the telegraph, the price is regulated by what grain can be imported for, which, taking the last five years, has ranged from 16s. 6d. to 22s. per 3 bushels, 203 lbs. gross, including 2s. duty and cost of bag. Our Cape wheat always commands the top market value, if not a slight advance, on even the best Australian imports. In the above we have quoted Cape Town and coast ports price; further inland, if supplies had to be drawn from the coast, carriage would tell on value, the railway carriage being 2d. per ton of 2,000 lbs. (10 muids of wheat or 20 muids of oats are taken as 2,000 lbs.) from station to station, per mile, irrespective of distance; cartage, &c., to buyers' stores is, say, 1s. 3d. per ton more. Imported cereals are charged at a rate of 3d. per ton per mile.

Most of the corn farmers have a few sheep, ranging in number

from 50 to 1,000; and these lamb about June when the grass is beginning to get strong, and thrive well despite the want of care. They are shorn twice a year—in September and October, and February and March. The average weight of wool per sheep, each shearing, is only about 2 lbs. Artificial food is never provided or thought of, no matter how dry or bad a season may be; and yet there is no reason why hundreds of "silos" should not be filled with the natural grasses which cover the fields in spring-time, to supply this want. Stock usually pays well; and towards Saldanha Bay, and the coast, a fair number of cattle are reared; they form a large proportion of the Bay farmers' source of income. Also on the wide open valleys and flats, towards the coast, wild ostriches are still met with, and when the mania for ostrich-breeding was at its height, the birds proved a small gold mine to the farmers in that quarter.

In the Eastern portion of the Colony, the most extensive arable lands are those in the Zuurveld districts of Lower Albany and Oliphant's Hoek, and next to them Queenstown, Aliwal North and other border districts. In these upper districts wheat is usually sown after the turn of the winter, in June or July; and on the coast lands as late as September. Since the country was first settled this grain has been more or less liable to be damaged by "rust," and only the hardy, flinty kinds are sown with any chance of a crop. The return in Lower Albany, when not so affected, is from 30 to 35 bags for one sown, if sown early—about ten acres being covered with a three-bushel sack (or muid) of seed. Barley, or bere, returns from 10 to 15 buhsels per acre. Oats are largely grown for forage, forming the staple horse food of the country. The best variety sown is the white side, or Tartar oat, which, though occasionally slightly affected, withstands the rust better than any other sort which has been tried. The average yield of oat-hay is from 2,000 lbs. to 3,000 lbs. per acre, but as much as 6,000 lbs. has been reaped off an acre. The return of grain is from 35 to 49 per cent. A bag of good side oats (3 bushels) usually weighs 160 lbs; but since rust has commenced its ravages, the average is not more than 130 lb. Wheat averages, in full three bushels sacks, as high as 230 lbs. Barley (5-rowed), if thrashed soon after being reaped, 180 lbs. to 200 lbs. per sack; and English, or 2-rowed barley, 210 lbs. to 220 lbs. The divisions of Albany and Bathurst and Alexandria grow a great deal more wheat now than formerly, and some of it is of very excellent quality.

Indian corn or maize, known under the name of "mealies," is grown all over the country, and yields most abundant crops of good food, both for man and beast. Throughout the border and in the Kaffrarian districts, where it enjoys the summer rainfall especially, it is largely cultivated. This grain possesses the advan-

tage of coming to perfection in a shorter time than most other cereals. It requires but little care in cultivation, and is not affected by rust, or any other disease of any importance.

Kafir-corn, or millet, is chiefly raised by the natives, being largely used by them, either boiled for food or malted as beer.

Potatoes, and all kinds of European garden vegetables and pot-herbs, do well, and can be grown all the year round. Sweet potatoes, pumpkins and melons are produced and supplied in wagon loads. Beet is raised extensively, and from some trials that have been made to test the quality of sugar it contained, it is found equal in this respect to any samples of the plant grown in France, Belgium, or elsewhere. The kindred plant, mangel wurzel, when tried, has likewise proved a satisfactory crop, as have also Swede turnips.

Tobacco is cultivated in several parts of the Colony, from Clanwilliam and Piquetberg on the west, and all along the east coast up to Kaffraria. The soil in many parts seems well adapted to the growth of the plant; but in the process of curing the leaf and preparing it for consumption, there is much room for improvement. To secure a knowledge of the best method of cultivating and preparing this product, the Government was authorised by Parliament last year, to obtain the services of an expert who will be able to give cultivators instruction in these matters; and Mr. Pieter Johan Bosch, from Arnheim, Holland, who has excellent testimonials of an experience gained in Java, has been selected for the office.

In the rich limestone valley of Oudtshoorn, with great facilities for irrigation, and considered the most fertile in the Colony, the production of tobacco amounts to 3,000,000 lbs. per annum. As much as 4,000 lbs. weight have been raised there from one morgen of ground (two acres). Tobacco has been grown on the same soil in this district for nearly a century, without any deterioration. The following notes on the present mode of cultivation are furnished to us by an inhabitant of the highest authority:—

Cultivation of Tobacco in the District of Oudtshoorn.

Seed.—The original seed was probably introduced by the old Dutch settlers from Holland and Batavia; of late different varieties have from time to time been distributed amongst the farmers.

When sown.—The time for sowing is from May to July. The seed is mixed with ash or finely pulverized soil, and sown in carefully prepared beds, which are also covered with thorn bushes as a protection against frost.

Transplanting.—In the months of September and October, the young plants are sufficiently developed to admit of their being transplanted. They are planted in rows about three feet apart.

Manure.—The ground is well prepared and manured. Goat, sheep, cow and horse manure, the only kinds available, are used; ash is being tried on a small scale by a few farmers. The tobacco fields are manured every alternate year, the best soils every third year; this is a remarkable fact, when it is remembered that the same fields have been planted without intermission for from 25 to 75 years, and that not the least deterioration is perceptible, the growth, on the contrary, being most luxuriant. On the best soils each plant yields 1 lb. of tobacco in the roll. The soil is, of course, exceedingly rich in lime, as is the entire tract extending from here through Ladismith and Montagu, to Robertson. It may be added, that no tobacco can be grown here without regular irrigation.

Suckering.—About three or four months after transplanting the plants are carefully cleared of all suckers or shoots in order to promote strength in the leaf; the tops also are removed, from 15 to 20 leaves are allowed on each plant.

Blight.—The plantations are as a rule remarkably free from blight. Occasionally *rust*, sometimes *white rust*, makes its appearance; the leaves are then mottled with patches of red or white. Much trouble is, in some years, experienced from the ravages of a grub that attacks the young plants. The farmer's dread is a hailstorm in between December and February; fortunately, however, these are but rare.

Gathering the Crop.—In the months of January and February the plants are cut down, yellow spots on the leaves being evidence of maturity. The plants are left lying in the sun until evening in order to effect proper withering.

Drying.—They are then taken to the drying shed, which is, in most cases, a roughly thatched structure. But very frequently they are hung closely on low staging either in the open or under orange or oak trees. Here they are left for about a month until considered properly dried.

Stripping.—When the plants are taken down from the drying shed, the leaves are stripped from the stems. Hitherto, as it was unnecessary for the purpose in view, there has been no sorting or classifying of the leaves. About 15 or 20 leaves go to make a "bosch" or bundle, bound together with a cord of a species of rush (matjesgoed). These are then damped slightly on the outside and stowed away in the shed, until the want of money or the state of the market induces the farmer to twist the leaves into long strings and make them up into rolls, when he takes them by waggon, principally to the markets in the Eastern Districts, or to the Diamond Fields and the Orange Free State.

Little or none of the dry leaf finds its way to the market or merchants, as there is no exportation and but very little local manufacture. So much, however, as is manufactured for smoking purposes by Mr. A. Pocock of Oudtshoorn finds a ready sale throughout the Colony.

Roll or Twist Tobacco.—In making the rolls the process is as follows: After a rough sorting of outsides, the leaves are steeped in lye prepared from the ash of a small succulent shrub (lidjesboschje), which is found here in abundance, or from that of another shrub; they are then allowed to ferment for two or three days before twisting into long

strings, a sufficient length of which is done up into rolls of six or eight lbs. in weight. This work is performed chiefly by the coloured people, men, women, and children, who receive very good pay, as they in many cases suffer considerably from the effects of the narcotic. These rolls are apt to rot unless care be taken that the leaves are not soaked with water when twisted.

Production.—It is estimated that the yield of tobacco in this district alone amounts to about 3,000,000 lbs. per annum. This is consumed within this and the neighbouring colonies; a large proportion being used for sheep-dipping.

General prospects of the trade.—Much of the leaf grown in this district will compare very favourably with the generality of that grown in other countries; but up to the present time enterprise and capital have been wanting to place the article in the markets of the world. Were this to be done, the production would be largely increased, and more careful attention given to the cultivation and general manipulation of our tobacco. New interest is now being awakened in this important branch of industry, and it is confidently expected that the apointment of a competent expert, sanctioned during the last session of Parliament, will lead to its speedy development Roll tobacco sells in the Colony at prices ranging from 3d. to 9d. per lb. Good leaf at from 3½d. to 6d. per lb., though this quotation is not of much value, as there is no demand for large quantities.

Although the Karoo districts are chiefly pastoral, the soil, like that of Oudtshoorn, is naturally rich, and only wants the fertilising power of water to produce the heaviest crops. In favourable situations along the rivers, farmers form dams or weirs and lead out furrows from which the arable lands are irrigated; in other cases they raise the water by centrifugal pumps from the bed of the streams, which run at great depths below the surface of the adjacent lands. Thus at many places along the Orange River, there are several pumps worked by stream power, supplying water from its bed, and large areas adjacent to it are brought under cultivation.

Over the greater part of the Karoo, water can be found by sinking wells. The horizontal beds of sandstone and shale, which form the flats or level plains, are generally intersected by igneous dykes known to the farmers as "Yzer Klip Kopjes" or iron stone ridges. These cross the beds of sand and shale vertically, and arrest the veins of water which permeate them, forming natural underground reservoirs. Generally, by observing the natural drainage area, and sinking alongside these dykes, where they form breaks or "poortjes," springs of considerable volume may be found. In addition to the igneous dykes, there are also limestone bands traversing the shale beds, and these sometimes seal up the fissures of the stratified beds so hermetically that springs are produced by their interposition in the same way as with the dykes.

Nature has made it easy to follow the course of the dykes, for they are marked by a low ridge of dark colour traversing the country, while those covered with soil are rendered conspicuous by the "Karreedoorn" and "Wolvedoorn," and other bushes growing along their course. The sub-surface water-courses are known to the farmers as "aars" or arteries, and from the vegetation above them are almost as legible as footpaths. An interesting pamphlet on the subject of opening up these springs and wells has been published by Mr. Thomas Bain, Road Engineer,* who mentions a remarkable instance of an unbroken dyke running across a valley a little below the village of Calvinia. The village, being above the dyke, stands on an underground reservoir, supported by a tolerably good drainage area. Hence it is that, by sinking wells, water can be found at a depth of 8 or 10 feet in any part of the village.

The number of windmills which now are to be seen dotted over the plains of the Karoo indicate that springs and well-sinking have of late years been much resorted to. The usual way, however, of conserving the limited rainfall of these central elevated plateaux is by the construction of dams, and impounding the flood waters which would otherwise flow off to the sea. There are a great many forms of dams existing, indeed the larger part of the country is entirely dependent upon water thus collected for the use of stock and other purposes. Some few of these dams contain when full as much as two hundred million gallons of water, and in several instances farmers have proved themselves very successful in producing sufficient grain for their individual wants, some even raising a surplus.

As an instance of what can be done in the way of irrigation, the Fish River, draining part of the Fraserburg and Calvinia districts, affords an example. It has there been found possible, by the construction of simple weirs of stone and bush, to raise the flood waters to a height sufficient to cover the enormous flats bordering the river on either side, and of this fact farmers have largely availed themselves. The early operations were carried out by unassisted private enterprise, and met with fair success; but, of late years, considerable sums have been advanced under the Irrigation Act for the better construction and strengthening of the weirs now in use, with the result that the yield has been increased sevenfold within that time.

Some similar works have been constructed along the banks of the Zak River, into which the Fish River flows some distance above its junction with the Orange River, and it is anticipated

* "Practical Hints on Water Finding in connection with Geology and on the Construction of Dams," by Thomas Bain, C.E., Cape Town. Richards & Sons, Government Printers, 1885.

that very large areas on both streams, in addition to those now cultivated, will be brought under the plough within a comparatively short period of time. The soil is of great depth and is peculiarly rich, the width of the valleys varying from a half to five miles in extent. Capt. Balfour, C.E., says of this locality:—"The average height to which the crops grow varies from five to seven feet, and the ears measure from six to nine inches, full and well developed. After the first crop is reaped, a second one may be expected without sowing;" and sometimes even a third comes up. The yield last year (1885), which has been what is considered in that back country a fair season, would probably exceed thirty thousand bushels. The conditions necessary to the securing of a reasonable harvest may be stated generally to be one thorough soaking of the soil before seed time and one flooding after the plants are well grown; an additional flooding in season naturally enhances the yield.

The only effort that has been made to effect artificial irrigation on a scale of any magnitude, is the Government scheme of Van Wyk's Vlei, described in a preceding chapter. The reserve for this work was about eighty thousand acres, but, owing to the serious losses farmers have sustained during the recent years of drought, Government have been compelled to resume possession of at least an equal extent of land lying contiguous to the property. The dam closes the mouth of a gorge, the sides of which are of no great elevation, and through which the water passes to a lower level, the outlet to the dam being over a depression in the ridge to the eastward of the earthworks, through which superfluous water is discharged to a point in the valley more than a quarter of a mile below the works, thus affording absolute safety in periods of flood. The area feeding the dam represents about an eighth part of the drainage area discharging its waters over the property; the dam, in fact, being upon a side stream about seven miles above its junction with a larger main stream. A canal of some four and a half miles in length has been constructed from the dam towards the junction of these two streams, commanding a large extent of arable land, of which two thousand five hundred acres are now under survey, the area still available for survey being at least three or four times as great as that now measured. Apart from the fact that these lands can be irrigated by water caught in the dam, floods from the main stream are of frequent occurrence during the sowing season, and can, at very slight cost, be led out and utilized for the first soakage of all sowing lands to be offered for sale, thus giving the leaseholders the very exceptional power of being able to husband the water in the dam for use at a later period.

The lands available for irrigation below Van Wyk's Vlei are variable in quality. Those in the main valley are probably equal

in richness to the Fish and Zak River lands, some patches amounting perhaps to a fifth of the whole, being of indifferent quality, and a little, here and there, is too poor for cultivation. The enormous area, however, of good level ground below the dam, affords a choice of far more than sufficient land on which to employ the impounded waters. Cultivation of a similar class of land to that now obtainable has been effected on parts of these lands, but the experiments hitherto made by aid of water in the dam are too recent to allow of a decisive opinion being formed as to whether the yield will exceed that gained by what is called natural irrigation. It is, however, satisfactorily proved that wheat, barley, and oats yield abundantly. All common vegetables thrive well. Some five hundred trees have been planted within the last few months, and are growing freely. Vines are a success as far as their growth is concerned, but it is doubtful whether viticulture can be carried on to any great extent, owing to the fact that untimely frosts are apt to damage the crop. Roots, such as mangel, sugar, beet, carrots, turnip, &c., thrive splendidly. Mealies, sorghum, and lucerne can be depended upon for a full crop of forage during the summer months, and ensilage can be carried on to any extent.

Turning eastward again, in the direction of the country adjacent to Port Elizabeth, the valley of the Sunday's River offers a fine field for the promotion of irrigation. Here an association has already been formed—the Sunday's River Land and Irrigation Company—which is setting an example of what may be done on a large scale by private enterprise. They have acquired upwards of 74,000 acres of varied "veld," 15,000 to 16,000 acres of which are capable of being irrigated, comprising the vast valley through which the river winds for a distance of 15 miles, irrigation canals for six miles having been already constructed. The soil of this valley is a very rich alluvial, being composed of the periodical deposits of the river for ages. The depth of soil varies from 20 to 45 feet; and wherever cultivation has been attempted the growth has been most luxuriant. On the homestead "Hillside," occupied by Mr. J. S. Kirkwood, mealies (or Indian corn) grow fourteen feet high. Tobacco thrives well there, and Mr. Kirkwood has a vineyard in a very healthy condition. Indeed, there are on the banks of the Sunday's River, at Darlington, Jansenville, and Graaff-Reinet, some of the finest vineyards in the Eastern part of the Colony, proving the fitness of the soil and climate for viticulture. Wheat, barley, and all kinds of cereals, as well as vegetables, grow abundantly wherever they have been planted; while under the former proprietors orchards containing as many as 500 trees were in existence. Of the remaining 60,000 acres a great part is grass and bush, affording both grazing and shelter for live

stock; cattle, goats, and ostriches thrive well on this pasture. The estate extends some way into the densely wooded kloofs of the Zuurberg Mountains, which abound in valuable timber, suitable for fencing, building and other purposes. There are twelve homesteads on the estate. Indeed, it consisted of twelve farms when it was acquired by the company. Twenty years ago fine crops of grain were raised on many of these farms, the land being irrigated by water led out from the river by means of gravitation. On the discovery of the Diamond Fields the sons of the old owners of the farms were tempted, by the large prices paid for the carriage of merchandise, to the new Adamantia, and abandoned husbandry for the more lucrative occupation of "kurveying." Thus the old dams and watercourses fell out of repair, and the rich land has practically been lying fallow ever since, having being turned into runs for the numerous herds of oxen employed in the carrying. On one portion of the estate a village is being formed by about 20 to 30 families (European). Each holder has a certain portion of arable land, and has proportionate grazing rights over the extensive commonage. On another portion 500 Natives live. They cultivate mealies extensively, and have 1,400 head of cattle grazing on the commonage assigned to them. The facilities for sending produce, agricultural and dairy, to market are good, the Midland Railway running through the estate at a distance of about four miles from the river; and on the other side the Addo Station on the North Eastern line is only fifteen miles distant. Thus all the principal markets of the Colony are easily accessible. Should the attempt now being made to establish cotton-growing as a Colonial industry succeed, there is no doubt that the Sunday's River Valley will be found most suitable for it.

With the facts proven that with natural irrigation astonishingly remunerative returns may be obtained from the soil, and that life-giving water can at no great cost be artificially impounded and so distributed that adjacent fertile lands can be utilized for agricultural purposes, especially grain and fruit-growing, it is certain that, under proper direction and management, there is ample room for the extension of Irrigation, and that a great future awaits its general practice throughout the Colony.

The chief Pastoral pursuits of the colonists are horse, cattle, goat, ostrich and sheep-breeding; and fully one-third of the entire population may be said to be engaged in these and other occupations subsidiary thereto.

The horse-stock of the Colony at last census was 205,985. That number has now probably doubled, but at present there is no extensive market for horses, and breeders are wishful that the Imperial or Indian Governments would establish a remount establishment here, or make their requirements known and the

price a certain class of animal would always command, as there would not be any difficulty in providing a regular steady supply. Cape horses are celebrated for their hardy and enduring qualities. The original stock came from South America; they were afterwards improved by pure Arabs, who gave them their characteristic of good constitution and indomitable pluck; and they have since had a large infusion of English thoroughbred blood, both racers and roadsters. There are a considerable number of notable sires in the Colony,* and several thoroughbred dams have also been brought out, much more attention being now given to the character of brood mares than formerly. The principal studs in the west are those of Messrs. Melck, Kotzé, Breda, Van der Byl, Faure, and Alport; in the Midlands are Mr. Rose of Beaufort, Mr. Burgers of Murraysburg, the Messrs. Southey and Distin of Middelburg, and Messrs. Hilton Barber, Heathcote, and Mechau of Cradock; Mr. Moorcroft of Dordrecht; and the famous establishments of Messrs. Van Zyl, Oosthuysen, and others in the Hantam, Colesberg.

The cattle of the Colony include the descendants of the long-horned native species which the Hottentots possessed in Van Riebeek's time, crossed with the Dutch breed introduced by the early colonists. To these have been added contributions from nearly every breed known in England and Holland—Shorthorns, Herefords, Ayrshires, Devons, Alderneys and Kerries. A great extent of the grass pasturage along the coast districts is well adapted for cattle, including the tracts known as the "Zuurveld" or sour grass country, where they attain to magnificent condition, the finest oxen employed for transport riding being supplied from that quarter. Many of the farmers of Albany, Peddie, Victoria, and King William's Town are not only cattle breeders but also "kurveyors" (transport riders) and have always some wagons and teams on the road.

At the last census the total number of draught cattle in the Colony was returned as 421,762; and other cattle 689,951; to this has to be added the cattle in the Transkeian Territories, now annexed to the Colony, numbering 218,931 head, making a total in 1875 of 1,330,644. The average value of draught oxen in the Colony during the last five years has varied from £9 down to the present price of £6 10s. per head, and in the Transkei it is about £6 per head.

Dairy farming near to the centres of population is very profitable to those who have a knowledge of it, the average price of fresh butter being 2s. per lb., and sometimes it has been known to

* The *Racing Calendar* (1884), gives the following as among the notable sires in South Africa:—Almoner, Berzelius, Bismarck, Buxton, Capillaire, Catalpa, Conductor, Deluder, Elf King, Eurus, Fire King, Glastonbury, Il Gladiatore, Ivanhoe, Jacobin, Mr. Dodd, The Monk, Morning Star, Plunger, Selborne, Sir Marmaduke, St. Augustine, Student, Tapestry, The Minstrel, Visconti, Whackum, Winchester.

run up as high as 4s. or 5s. per lb. In the inland districts the yield of milk very much depends upon the quantity of food the cows can get; and as the animals are entirely dependent upon the natural veld, unless there is a good rainy season the share of milk that comes to the dairy is but small. Up to the present time very little has been done towards the systematic cultivation of food for milch cows or other stock; but in some parts the wild grasses growing on "vley" grounds are being cut and stacked for winter food, and "silos" are also being built, and ensilage will no doubt ere long form an important addition to the food supplies of the stock-breeder.

Very many farmers have flocks of goats—in most cases the common goat of the country, but often mixed with various grades of Angora blood. These original goats are a very hardy race of animals, and live where sheep cannot, and supply meat which, though not equal to Southdown wether mutton, is quite passable, and very useful on a farm. They breed and increase very fast, having as many as five kids at a birth, and seldom less than two; they are, altogether, a useful animal, and give a skin which is unequalled for the manufacture of superior leathers.

The beautiful Angora goats, yielding the valuable mohair, were first introduced to the Cape by Colonel Henderson of Bombay. Afterwards the Hon. Dr. White obtained some through Sir Titus Salt; and the stock resulting from these found its way to Caledon, Swellendam, Graaff-Reinet, and Richmond districts. Later on, Messrs. Mosenthal Brothers, who appreciated the value and importance of a fleece-bearing goat as next to a wool-bearing sheep, tried to secure some pure-bred animals from Angora, and in 1856 succeeded in doing so. Since then importations have been effected by other private individuals and mercantile firms. One of the latest and most important was that by Mr. J. B. Evans, who visited Asia Minor, and obtained some goats from the mountain districts of Teherkess and Geredeh; these were introduced into the Colony in 1880, and some of the rams were sold at from £100 to £400 to the breeders of Graaff-Reinet and the Eastern districts.

Although mohair only began to figure in our exports in 1862, the quantity then being 1,036 lbs., it has steadily advanced in quantity and quality, and last year (1885) it amounted to 5,251,301 lbs., of the declared value of £204,018. Cape mohair promises, with care and attention, to excel Turkish in the various qualities prized by the manufacturers. A Bradford authority, writing to Messrs. Savage and Hill, of Port Elizabeth, says:—"In time with careful and intelligent cultivation, the Cape might take its place as equal if not superior to Turkey as a mohair-producing country. The lustre, as a rule, is nearly equal to that of Turkey mohair, and it is softer and finer. In the best lots there is nearly

as much freedom from kemp, and the kemps are not usually so thick and coarse as those in Turkish mohair. The colour is generally superior. The medium are largely used for wraps for making mohair plush, and here again the fineness of Cape mohair is most suitable, as it makes a full, rich plush. There is no doubt that South Africa is eminently suited for the growth of mohair, and that it only rests with the people of the Colony to make it some day the greatest mohair-producing country in the world."

With Angoras, as with our Merino wool-bearing sheep, the fundamental rule which will determine the value of our staple products for the future is the degree of attention given to the selection of the best of stud rams, the proper classification of ewes, and the systematic culling of flocks—carefully eliminating the worst, and breeding only from the best specimens of each generation. The same rule will also apply to the breeding of ostriches.

The Colony is more like Spain, the original home of the Merino sheep, than any other country; and wool of excellent quality can be grown throughout our various divisions. But in many parts the evils of injudicious and indiscriminate breeding, and the irrational system of farming and kraaling stock, has tended to deteriorate the general character of the staple. The small farmers have been content to grow wool on no very definite plan, and to shear twice a year as a matter of profit, or on account of scab in their flocks; the consequence being a good deal of produce of an indefinite, inferior, and rubbishy type. The exhibition held at Port Elizabeth in December last, shows, however, that wool of a well-defined character and superior quality is raised by our leading flockmasters. The gold medal for the best exhibit of grease wool was awarded to Mr. A. W. Hart, of Cathcart, the sample being described as of "superior quality, long sound staple, splendidly got up, and in every way suitable for combing purposes." The gold medal for grass-veldt wool was given to Messrs. Geo. King and Son, of Bedford district, for long, fine, well-bred wools, strong in staple. Mr. J. Kemp, of Cathcart, was also recommended a gold medal. Amongst the other prominent and successful exhibitors were Mr. R. Rubidge, of Graaff-Reinet, whose stud stock is of high repute; Mr. Murray, of Colesberg, whose clip was considered very desirable for combing purposes, and altogether creditable to the district; Mr. Vermaak of Burghersdorp, Mr. Brown of Cathcart, and Mr. A. Vigne, of Middelburg, who were recommended silver medals; and a host of others who received honourable mention. It was noticeable that several of the exhibits were wools of the Australian character, many of the frontier flockmasters having recently imported rams and ewes from Australian stud flocks, considering that the accli-

matised Spanish Merino of Australia is well adapted to our climate and pasture, and that by careful selection and pure breeding they may maintain their character for uniform fleeces and the finest wool in the world, as judged by the standard of the highest attainable market value.

Our foremost sheep-farmers work their farms on the most modern and improved principles. Notably in Caledon, Swellendam, Beaufort West, Graaff-Reinet, Willowmore, Richmond, Middelburg, Cradock, Somerset and Bedford, there are estates having large and comfortable homesteads and outbuildings, surrounded by trees and cultivated grounds, shewing every evidence of enterprise and energy. There are washing pools, dipping tanks, drafting pens, and roomy, clean sheds, where the wool is shorn and sorted according to its several qualities or descriptions. At suitable places throughout the sheep-runs, dams or reservoirs are constructed, where the flocks are watered without having any distance to travel, and at several of them there are small houses or stations where the superintendents or stockmen with their herds live for weeks together, visiting the head station only at intervals, as occasion may require. These superintendents, in many cases, are young men of good family, who thus acquire a practical knowledge of pastoral pursuits, and in a few years are qualified to take the charge of other farms, or work lands on their own account.

Throughout the country generally, however, the old and still most common practice of farming is to graze the flocks by day, under the care of a native herd, who guides their depasturing over the part of the farm allotted to the special flock under his charge, and at evening time drives them home to the "kraal," where they are kept all night. These kraals or folds are made of various materials, the commonest fences being a high, thick hedge of thorny bushes, or an enclosure built with blocks cut out of the accumulated dung and *debris* of the old kraal. Stone walls are erected in many places where stones are handy, and in some of the more exposed situations, where the farmer has the enterprise and the ability, the stone walls are converted into sheds.

The decrease of stock and the deterioration of some farms on the frontier which formerly carried sheep well, led the Government, in 1876, to appoint a Commission to enquire into the matter. This Commission attributed the evils complained of to three causes, namely, overstocking, whereby the best and most nutritious food was trampled and eaten down without any opportunity of propagating itself; the wearing out of the veld by the sheep travelling to and from the kraals morning and night; and the conditions of the kraals—chiefly the manure accumulations of years—favouring the development of various kinds of parasites. The remedies they

proposed were fencing in and subdividing the farms; allowing portions yearly to seed down and recover; sowing grasses and karroo plants; and making provision for times of drought by preserving the veld for any such emergency. The Commission stated:—

"The time has passed, or is rapidly passing, when sheep-farming can be carried on profitably under the old system. Besides this, there are the general advantages of fencing experienced in other colonies, such as the cheapening the working of sheep-runs, the improved condition of the sheep by avoiding the driving of them in the heat and when they are full of water and food, the prevention of contagion from scab and other contagious diseases, the spread of parasites by stray sheep going over a clean run, the increased yield of wool, the saving of tramping out the grass by driving to and fro, the being able to let the grasses seed and multiply by sparing annually parts of the run, the depositing of the excrement of the stock on the land as nature meant it to be, instead of heaping it up in kraals where it breeds innumerable flies, and the making it practicable to scatter grass and Karoo seeds during rains, with a fair prospect of their becoming permanent, by keeping the stock off, which is impracticable under the kraaling and herding system."

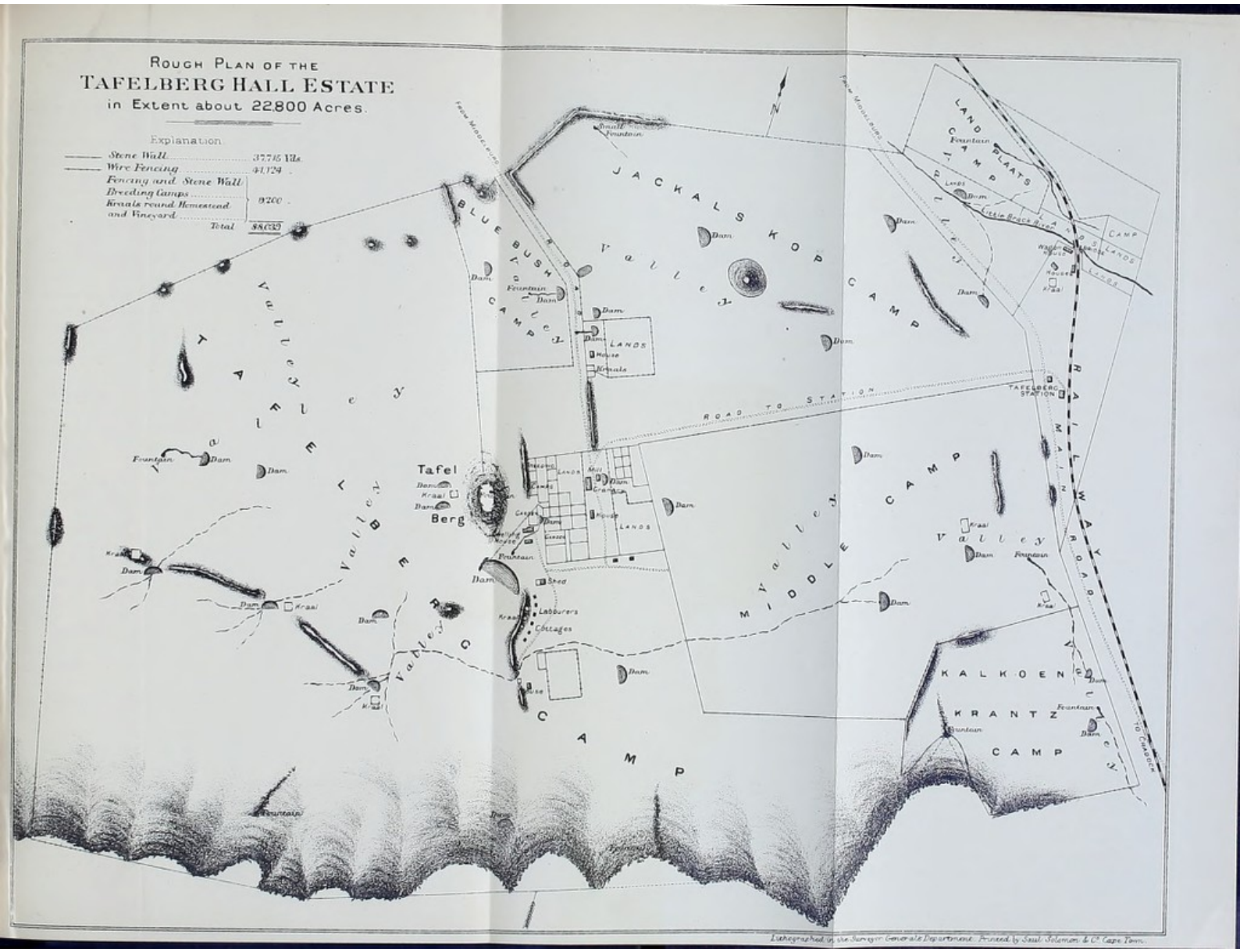
Prior to this time, fencing had been adopted by many flock-masters, those of the Caledon district having been amongst the first to form enclosures, in which their stud sheep, troops of blood mares, and herds of antelopes (chiefly bonteboks) respectively grazed. The extension of ostrich-farming and the necessity of the formation of camps for these birds, gave a stimulus to fencing; and experience of its advantages for the improvement of stock generally, led to the passing of an enactment by the Legislature, in 1883, to regulate the erection and maintenance of dividing fences, and providing for occupiers of adjoining lands contributing to the expense of constructing the same; the operation of the Act, however, being limited to proclaimed divisions.

This system of fencing of runs is silently bringing about a revolution in stock-farming. Subjected as portions of the Colony are to severe and protracted droughts, it enables the farmer to keep a part of his pastures in reserve to meet any such contingency. Even in the Karoo districts, the benefit of enclosing, and the improved condition of the pasturage and health of the flocks resulting from it, are now being realised by the generality of sheep-farmers, and every man of any means is carrying it out as far as practicable. Some of the more enterprising have spent several thousands of pounds upon enclosures, and their stone and wire-fencing may be reckoned by tens and twenties of miles. Many names might be mentioned, but without any invidious distinction one may be selected, who was foremost in the adoption of the system—Mr. J. S. Distin, of Tafelberg Hall.

Tafelberg Hall estate is situate on the upper Karoo Plateau, about 20 miles from the district town of Middelburg. A railway station is on the estate, and within half an hour's drive of the homestead. The property is about 22,800 acres in extent, lying on the extensive plains, studded with flat-topped hills, which slope away on the eastward side of the Sneeuwberg mountain chain. Its lands are all enclosed and divided into camps, the fences consisting of stone and wire, extending over some 50 to 60 miles. The stone enclosures were commenced before the days of wire-fencing, and were constructed by native labourers; the walls average 4 feet 6 inches in height, and are three feet wide at bottom (with ample provision at short distances for water-way), and from 18 inches to 2 feet at top. About half of the wire fence is composed of eight wires with poles five yards apart; in the other half the poles stand ten yards apart with the wires laced between them, the span between the wires being 4 six inches apart, 3 eight inches and 1 nine inches.

Behind the homestead rises the table-topped hill from which the property takes its name, and on each side of it as well as in its rear are broad valleys stretching away to the mountain ridges on the horizon. Here, in their respective camps, horses, cattle, sheep, goats and ostriches are pastured on the aromatic Karoo bush which has the advantage over grass that it is not injured by frost in winter, and even when in driest seasons it appears but a parched brown stubble, sapless as a worn-out broom, it still affords nourishment to the animals, and, provided drinking water is available, stock can be maintained in good condition throughout the year. In each of the enclosures the storage of water is regarded as of great importance, and where there are no fountains, small semi-circular dams or tanks are constructed of sufficient depth to prevent rapid evaporation. Near to the homestead again are small enclosures, some of which are set apart for the horses, mules and cattle required for the daily work of the farm. The utility of these small camps was established during the period when ostrich breeding was at its height; at that time, within six years, Mr. Distin sold chicks and birds to the value of £11,167, and over a period of eleven years the value of ostrich feathers disposed of by him was £26,674.

Another feature of the estate is the capacious dam or reservoir which has been formed by the construction of an embankment about 300 yards across the foot of the valley on the left side of the Tafelberg. When full, which it is in every season, it forms a magnificent sheet of water about two or three miles in circumference, with a depth of from 12 to 14 feet in the deepest part. This is the source of all the profusion of foliage which environs the homestead of Tafelberg Hall. On approaching it, one may imagine one's



Lithographed in the Surveyor General's Department. Printed by Saul Solomon & Co. Cape Town.

driving up the grounds surrounding some villa residence at Rondebosch or Wynberg, with shady trees and roses and other choice flowering shrubs on either hand. The water irrigates a large extent of garden ground, vineyards, corn lands and lucerne fields, and is also utilized for driving a corn mill, and other purposes. Hundreds of fruit trees of all kinds grow luxuriantly here, some of the fig trees covering a space of 25 by 10 yards, and mulberry trees standing 40 to 50 feet high. The orange, apple, pear, peach, plum, nectarine, apricot, loquat, lemon, quince, pomegranate, walnut, almond, cherry and strawberry, one and all, thrive well and yield plentifully. About 1,000 bushels of wheat are raised from the corn lands, the average yield without manure being 15 to 25 fold. In ordinary seasons water is led to the lands three times, but in dry seasons it requires to be led as often as six times. The farm buildings, it may be added, are on a large scale, and the accommodation for overseers, ploughmen and labourers is as substantial and comfortable as upon any estate in the mother country.

Tafelberg Hall is not an exceptional instance of what can be done in the way of converting the plains of the Karoo into fertile and valuable stock-bearing properties. Many others might be mentioned. In the same district, and in close proximity, there is the estate of "Varkenskop," belonging to Mr. W. R. Southey, about 12,000 acres in extent, which is wholly enclosed by wire fencing and divided into five camps. This farm is on the Great Brak River, and the stream is led out by a furrow which supplies a large reservoir, whence the water can soak the arable lands on the adjacent level flats for miles, and afterwards re-enter the river further on. At "Culmstock," a property of 14,000 acres, owned by Mr. Charles Southey, the whole extent is also enclosed partly by stone walls and partly by post and wire fencing. In the camps on these places, wild game is preserved and troops of springboks playfully disport themselves alongside of the ostriches. On the estates of Messrs. A. Vigne & Co., at "Doorstfontein," and on Messrs. Hilton Barber's and Heathcote's extensive properties, the same system of enclosure is carried out. These examples have stimulated the farmers of the old colonial stamp to follow in their wake, and now the many advantages of fencing have become so evident, especially during the recent severe droughts, that in the Cradock and Middelburg districts there are few places where it is not adopted, more or less.

All this is tending to the improvement and conservation of stock, and, with good seasons and better markets, will increase the profits of farming and the wealth of the country.

WOOL.

By W. Spilhaus.*

Since Jason set out on his expedition in search of the golden fleece, many thousands have followed his example, but when we examine the records of their success we are obliged to give the prize to those who have directed their attention to the animal that furnishes the genuine fleece, the woollen fleece, and the metaphor of the Greeks has become a reality for the humble substance from which it was borrowed.

The total quantity of wool imported into the United Kingdom from British Colonies in 1831 amounted to 11,859 bales; since then it has been rapidly increasing, and in 1884 the imports from Australia and the Cape had reached 1,273,732 bales. The total of the 55 years gives the stupendous amount of 21,322,592 bales, which represents at £19 15s. per bale (the average selling price in London of the last 25 years), the magnificent amount of £421,121,192. South Africa participates in this with 3,919,834 bales, to the value of £77,416,721.†

It will be interesting to compare with this the total value of Gold extracted from the rich deposits of the Australian Colonies. As far as we can ascertain this was altogether £264,000,000 to the end of 1884. By far the largest part of this wealth was gained during a comparatively short time. From 1852 to 1857, £82,000,000 were produced. From that year the production dwindled down gradually to £4,000,000 in 1878; and after all we are not sure whether it was real wealth. The gold was simply and quickly transformed into counters. As the number of these increased they represented less value in all other commodities, prices of everything else rose rapidly, only to fall again, now that the increase of the number of counters available has not kept pace with the growing population of the world.

Wool, on the other hand, has slowly but materially increased the national wealth; a steady increasing supply has been kept up, and many millions of industrious hands have found employment in converting it for the use of mankind. Some conception of this may be formed when we compare the value of

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* The writer has thankfully to acknowledge the assistance kindly rendered to him by the Editor, who had, in his Handbook of the Cape and South Africa, for the Paris Exhibition, already exhaustively treated the subject of this paper. He is further under great obligation to the office of the Colonial Secretary for the readiness with which information has been collected for him from all parts of the country.

† All these figures are compiled from Messrs. Helmuth, Schwartze & Co.'s Annual Wool Reports.

the raw material with that of the manufactured article. The highest price paid for any wool in the November-December Series of auctions in London in 1884 was 2s. 9d. per lb. for a lot of Port Phillip lambs' wool, whilst good woollen tweeds still cost from 5s. to 6s. per yard, the finest goods being quoted as high as 12s. 9d. per yard, and the yard of such material will weigh only about half-a-pound. The weight of a woollen shirt, the wholesale price of which is 7s. 3d., is 16 ounces; a yard of fine flannel costing 13d. weighs 4 ounces; blankets are sold at from 14d. per lb. for union (wool and cotton mixed), to 22d. per lb., material for blankets being of the cheapest.

It must be a matter for congratulation that the British Colonies in the Southern Hemisphere are mostly particularly well adapted for the production of the Merino sheep. Through their aid there is no fear that for many years to come the British manufacturers will lack profitable employment. Amongst these Colonies it is true the Cape takes but a modest place.

The following Returns will show our Export of Wool from 1850 up to 1884:—

	lbs.	Value.
1850 ..	5,912,927 ..	£285,610
1860 ..	23,219,689 ..	£1,448,629
1870 ..	37,283,291 ..	1,669,518
1871 ..	46,279,639 ..	2,191,233
1872 ..	48,822,562 ..	3,275,150
1873 ..	40,393,746 ..	2,710,481
1874 ..	42,620,481 ..	2,948,571
1875 ..	40,339,674 ..	2,855,899
1876 ..	34,861,339 ..	2,278,942
1877 ..	36,020,571 ..	2,232,755
1878 ..	32,127,167 ..	2,114,341
1879 ..	40,087,593 ..	2,156,609
1880 ..	42,467,962 ..	2,429,360
1881 ..	42,770,244 ..	2,181,897
1882 ..	41,689,128 ..	2,062,180
1883 ..	38,029,495 ..	1,992,745
1884 ..	37,270,615 ..	1,745,189
1885 ..	34,432,562 ..	1,426,108

In 1830 the Cape exported only 33,000 lbs. Then the production increased with rapid strides until it apparently reached its climax in 1872. In that year the country had been enjoying successive good seasons, and the price then was the highest during the last 25 years. Messrs. Helmuth, Schwartze & Co. give the average value of a bale of wool in 1872 as £26 10s., whereas in 1884 it would be only £18. Since 1872 the quantity exported has been fluctuating, until in 1884 it amounted to the same weight

as in 1870. This reduction is owing to several causes. The Orange River Free State is a large sheep-producing country. In 1880 the Census Returns there showed 5,056,301 Merino sheep, which would produce about 25,000,000 lbs. unwashed wool. Most of this wool used to be exported through the Cape Colony; but since the Diamond Fields became a large market for Natal produce, facilities for the transport of wool to the Sister Colony increased, and much of the Free State produce must have found its way for shipment to Durban. Besides this, great and long-protracted droughts have unfortunately visited the Colony, and in some districts largely decimated the flocks. Last but not least, the retrogression in weight is accounted for by much wool being now scoured in the Colony which used to be shipped in the grease: this is proved by a comparison of the value. Although in 1884 the weight of wool exported was about 13,000 lbs. less than in 1870, the value shows about £75,000 more, notwithstanding that prices in 1884 were £2 15s. per bale lower than fourteen years previously.

The wool-washing establishments have greatly developed lately. There are a large number of them throughout the country, of which we may mention two at Colesberg and Aliwal North, one at Brak River (George), Cradock, Middelburg, Hanover, Hay, Somerset East, one private washing establishment at Ceres Road station, and four at Albert, turning out yearly about 16,000 bales together. Both at King William's Town and East London steam washeries are now in course of construction. At Uitenhage there are eleven establishments, employing about 250 hands each. In these washeries, somewhat more than 53,000 bales are yearly scoured, ready for shipment. The quantity last year was in all, 21,266,746 lbs. grease wool or 53,162 bales.

Besides these, there are two important Western establishments, the Waverley Mills, close to Ceres Road Station and the Zoete Inval washery at the Paarl Station, in which, together 10,000 bales of wool were scoured last year for shipment to England, Germany, Italy and Canada; one lot even having been sent to Rio de Janeiro.

Most of these washeries employ a Cape Colonial invention for cleansing the wool—Niven's Patent. It is very simple and particularly well adapted for short stapled wools. After yolk and grease are dissolved in the hot water bath, the wool is conducted into one end of drums in which an axle with spirally arranged spokes revolves quickly carrying the wool out at the other end. During this process it is subjected to rinsing in a strong stream of clean cold water, which is made to pass through the drums. Subsequently the wool is spread out over grounds loosely paved with round stones, and the African sun soon completes the drying and bleaching. Great sums have been expended on drying-machines, and many

are in use for rainy weather, but the brilliant whiteness of our best wools is only obtained in the sun. The capital invested in these washing establishments is very considerable, and it is satisfactory to notice that progress is made from year to year in the efficiency of their manipulation.

It is an open question whether the same may be said of the quality of the product itself, and in fact complaints are heard that our wool is deteriorating and not keeping pace with the advance shown by other Colonies. There may be some truth in this, but the amount of agitation about this matter at present will act as a powerful ferment, and is a guarantee that we shall not drop out of the race. There are good men all over the country investing money, despite of the low value of wool, to import fresh blood and to judiciously improve the breeds. Wool will for many years remain the most important production of the farming industry of this Colony, and the low values at present will be a blessing in disguise, as they will force our farmers to the closest attention towards perfecting their staple product.

It may be remarked here that unfortunately a great deal of scab is still prevalent throughout the Colony. Generally speaking, farmers are earnestly endeavouring to keep their flocks clean, and quite considerable amounts of capital and labour are yearly expended on curing the sheep; the most favoured remedy is tobacco, either boiled by the farmers, who grow or buy the colonial grown article, or from imported extract. Besides this, arsenic, lime and sulphur, Cooper's powders, and a great many other chemical preparations, are used; but a uniform, energetic action is still wanting. It is, however, to be hoped, and may be expected, that in the next Session of our Parliament an efficient law will be enacted.

Deep-rooted as the Merino sheep-farming industry has now become, it took a long time until it found a grateful soil in our country. It is reported that the first woolled sheep were introduced into this Colony by a Colonel Gordon, who was in the Dutch service, in 1790. He procured a number of rams of the fine-woolled sheep of the Escurial breed, which had been presented to the Dutch Government by the King of Spain. Of these he kept some himself and others he distributed amongst some farmers between Cape Town and Mossel Bay, who crossed them with the hairy native sheep, producing an animal with a rough, lustreless but heavy and abundant fleece.* There was, however,

* It will be interesting to know that part of the sheep brought out by Colonel Gordon were the original progenitors of the many millions of fine woolled sheep, which now form the principal wealth of Australasia. It appears that, when Colonel Gordon died, his widow had to sell his stock, and 29 of his sheep were put on board two English war ships, the "Reliance" and the "Supply," which happened to be in Table Bay, for the purpose of taking supplies to Sydney. (See "*The Colonies and India*" December, 1885.)

not much appreciation shown for this new pursuit. The farmers, mostly consisting of descendants from the Dutch and French, had no traditions about the rearing of Merino sheep; and even to this day there is not a woman among the Dutch farming population who understands converting wool into stockings or jackets! The native hairy, fat-tailed sheep which had been found by the first Dutch occupants of the Cape in possession of the aborigine Hottentots, forming large flocks, had been found useful and handy for the early white farmers. It is prolific, scarcely subject to disease and very hardy; its carcase furnishes excellent mutton; the fat of its enormous tail is much valued, and takes the place of butter and lard in the country; the skin is readily convertible into a soft leather. Even now the Cape sheep is bred on many farms in preference to its higher cultivated rival, and the last census (of 1875) showed a total number of nearly a million of Cape sheep in the country. This number has now rather increased than diminished, as the larger population of the Colony has made the production of mutton more profitable in many parts than the farming for wool.

Returning, however, to the history of the merino sheep, we find that it was not until 1812 that a commencement was made in earnest to acclimatise fine-woolled sheep. Two gentlemen, Messrs. J. F. Reitz and Michael van Breda, introduced some sheep of the genuine electoral breed from Saxony, and located them on farms in the Bredasdorp (at that time comprised in the Swellendam) District. They kept up the pure breed for many years, and in several flocks in the Swellendam District to this day the Saxon electoral type may be recognised. Somewhat later, Spanish merino sheep, bred by Sturgeon, were imported by Lord Charles Somerset, and kept at the Government farm at Groote Post near Cape Town, and at the Boschberg, a commissariat establishment on what was then the frontier, now the town of Somerset. Subsequently, in 1820, the English settlers in Albany imported a larger number of good Spanish merino sheep with fine wool, and in the East as in the West great progress was made in accumulating good and thoroughbred flocks. The Afrikander Boers* with their natural shrewdness and intelligence soon saw that for their increased wants, quickened by their intercourse with the numerous immigrants fresh from the civilised world that now poured into the country, they would best be provided with means by embarking in the new pursuit. A Willem Burger in Calvinia, some 50 years ago, procured some sheep from the Swellendam District: a little later Peschal introduced sheep from Albany and Cradock, Petrus Joubert and Jan Heefer procured some for the Colesberg District,

* The Dutch word Boer simply means farmer.

Kinnear took some of Mr. Reitz's flock to Beaufort West, and Dirk de Wet of the same flock to Victoria West, and P. J. J. Burger introduced thoroughbred sheep from Graham's Town to Murraysburg, and all these Districts became again centres for distribution elsewhere.

The breed has of course been modified and altered as the exigencies of market and fancy of breeders suggested. It was soon seen that for mass production, neither the fine-woolled electoral sheep nor even the Sturgeon sheep was the most profitable. Although Messrs. Reitz and Breda produced wool as fine and valuable, probably, as any from Saxony or Silesia, weights of both fleece and carcase were very small. Besides, there seemed to be a larger outlet for strong combing wools, and various breeds were introduced, the favourite being the Rambouillet sheep bred in the Famous french stud of this name, and most of the well-bred sheep of the Colony are now of this stamp. Latterly some importations have been made from Australia, from Pomerania, and Hanover; and in some districts, where it is noticeable that the wool loses too much of its fineness, Sturgeons will now be employed with advantage by breeders who judiciously study their business.

The character of the wool varies of course with the pasturage of the different districts, and with the care bestowed by farmers upon their flocks. The best wool, finest and strongest in fibre, is still produced in the area where thoroughbred merino breeding was first commenced in the west, comprising the coast lands east of the Hottentot Holland mountains. Along the mountain ranges of these districts, the homesteads, surrounded with oaks and other shady trees, with their gardens full of beautiful roses and the honeysuckle twining over inviting porches, and with their hospitable and kind occupants, remind us of the most pleasant parts of the old country. Most of the farms produce grain as well as wine, besides furnishing splendid grazing for sheep and cattle. The fertile soil gives six successive crops when virgin, and five crops when it has been under the plough before, without artificial manuring. Grape-vines grow easily and abundantly on the hill-sides, and the merino sheep here may be brought to produce the finest and strongest wool. Close to the coast, along the downs, the soil is more sandy and level. This is called the Duineveldt, where merino sheep thrive well and are subject to few diseases. Flocks from the upper country are frequently brought here for change of air and pasturage. The wool produced is characterised mostly by its strength of staple, not so much by its fineness, and from the different bushes growing here it assumes a blueish tinge. Between the Duineveldt and the mountain farms there are the "Ruggens"—undulating country, nothing but hills and valleys, here and there intersected by a small stream or rivulet, except where the

Breede river, with the waters of the River Zonder End and the Buffeljagt's river, takes its course towards the sea. These Ruggens are dry, and dotted here and there with mostly uninteresting farm-houses erected of clay with thatch-roof, seldom whitewashed, scarcely ever relieved by trees and shrubberies. But the extensive sheep walks on the Ruggens form excellent pasturage, although the wool here does not attain the strength of that from the higher and better situated farms. The characteristic feature of the whole of this country is the "Rhenosterbush" (Elytropappus rhinocerotis), a bush which has become evenly distributed through the agency of the merino sheep, the seed being transported across the country in its fleece. The bush is of no use except for fuel, but underneath it the grass sprouts readily, the bush probably promoting its growth rather than checking it, as it wards off the greatest heat of the sun, and yet with its wiry leaves does not shut out the light altogether.

According to the last census (1875) there were in these Districts in all 1,778 holdings with 929,588 merino sheep, and these figures probably do not require much modification now. A moderate farm holds about an average of 1,200 sheep, there are small farms down to 100 to 500 sheep, but there are also well managed estates with 5,000 to 7,000 sheep, and the largest flock-master owns altogether about 12,000 well-bred merino sheep. These farms are rationally managed; the sheep are divided about the grounds with outlying stations and sheds, and they are depastured in such a way as not to exhaust the runs all at once. The country carries from one to two sheep per morgen grazing-land. The animals owing to their origin from Saxony stock are mostly of small structure, but the mutton is valued for the delicacy of its flavour. They yield about 3 lbs. washed wool in the average. In these Districts the universal rule is to shear once a year. Formerly nearly all farmers used to wash their sheep before shearing them, either in a river or under a pump, but now much wool is shorn and exported in the grease. The fleeces are tied up in bundles and the locks and pieces should be taken off and packed separately. In many cases neglect is shown in this respect, but an improvement is already noticeable. The clip occurs during the month of October, and about this time the yearly wool-fairs in the more important inland towns take place.

Another complex of sheep-producing Districts stretches out parallel with the west coast, comprising the eastern parts of the Divisions of Clanwilliam, Piquetberg, Malmesbury and part of the Paarl; these are pre-eminently grain districts, and not so much importance therefore is attached to the rearing of sheep. However according to the census of 1875, there were 266,469 woolled sheep there, which may now be considered to have increased to about

325,000. There are 1,434 holdings altogether; most of which have but a small number of sheep; nearly all shear twice a year, and the character of the wool does not as a rule show a high standard.

The great division of Namaqualand produces but few Merino sheep; here the Cape sheep has still a greater hold upon the farmers, and along the sea-coast down to Table Bay, the country, being very sandy, is not adapted for sheep. The same may be said of the coast lands of the other side of George, Knysna and Tzitzikama, Port Elizabeth, Alexandria, and Bathurst. All along the valley called Longkloof, however, Uniondale, and Humansdorp, into the Uitenhage District, there are a number of sheep farms, and on the eastern side of the Sneeuwberg mountain range we get into the grass districts of Somerset East, Bedford, and Albany. These divisions contained in 1875, 1,033 holdings with 671,366 sheep, and here, it will be remembered, was another centre from which the merino sheep invaded the Colony. Here there are famous stock-breeders, and large flockmasters, the better farms owning from 5,000 to 10,000 sheep.

Further to the east the frontier districts furnish a formidable contingent towards our army of wool-bearers. These are the grass lands of Fort Beaufort, Stockenstrom, Victoria East, King William's Town, Queen's Town, and Cathcart. Some part of this territory has only recently been conquered, but the 1782 holdings of the first-named four divisions possessed in 1875 in all as many as 611,851 sheep; of this number by far the larger part, viz., 446,474 sheep, belongs to the division of King William's Town. The bad custom of shearing twice a year also prevails in these parts of the country, but lately sheep-breeding here has made great progress, and the wool known as the Kaffrarian enjoys a good reputation in the London market. Much has been done in importing superior rams, principally from Australia, and in fencing, and in other improvements of the industry.

Returning to the west again, we have two peculiar sheep Districts, the Warm and Cold Bokkeveldt in the Clanwilliam and Tulbagh divisions, with Ceres as outlet, and the Boschjesveldt in the Worcester District. The wool is shorn once a year in the grease, is fairly well bred, of good staple, but generally remains dull of colour when scoured. There are in all 595 holdings with, in 1875, 211,935 merino sheep.

But the greatest portion of the country taken up for sheep farming and the most remarkable part, peculiar to the Colony, is the *Karoo*. This large marvellous tract of country which has been regarded as semi-desert, is as fertile as the banks of the Nile, provided it receives sufficient moisture. But even the severest drought cannot destroy its vegetation. You look around for miles and miles

and see nothing but dusty ground and small stumps of bushes sparingly strewn over the surface, not a green leaf, not a blade of grass, except, at long intervals, rows of mimosa trees along the dry beds of rivers. You think this is desolation, a life-destroying desert. But at last you notice a building at the distance; you see trees near the house, you get to a farm, you are hospitably received, are treated with coffee and bokke melk (goat's milk); the old man shows you his fountain (spring) which he has newly opened up by aid of dynamite; he shows you his steam engine to pump up water for the flocks; his dam, that cost him hundreds of pounds; his garden with wonderful wheat and oats, splendid fruit trees, enormous pumpkins; he tells you, yes, it is *banj droog (very dry), during three years there has been rain only twice or three times; his lambs are lost, he had to cut their throats to save the ewes, and many of his big sheep are dead also, but the remainder is all right; as long as his fountain runs he has no fear; while they have water, they keep alive on the stumps of the bushes. And when rain, good rain comes, then all these bushes revive; there is a general resurrection, grass springs up, and there is an abundance of food for the flocks, which after first suffering from the sudden change, soon prosper and increase as nowhere else in the world.†

This remarkable territory takes its commencement from the first range of mountains in the west, it covers the terrace that runs along these mountains north of the Wittebergen and Zwartebergen Ranges out to the great Sneeuwberg Range, which extends from north to south; it covers the whole of the large upper Plateau north of the Roggeveld and Nieuweveld mountains till it is bordered in the east by the Stormbergen and slopes off towards the north to the Orange River. This vast area covers about 48 millions of acres; there are according to the last census—about 4,700 holdings scattered over it, and it carries approximately five millions of merino sheep. This territory, although of most fertile grounds, is subject to great and continuous droughts, and

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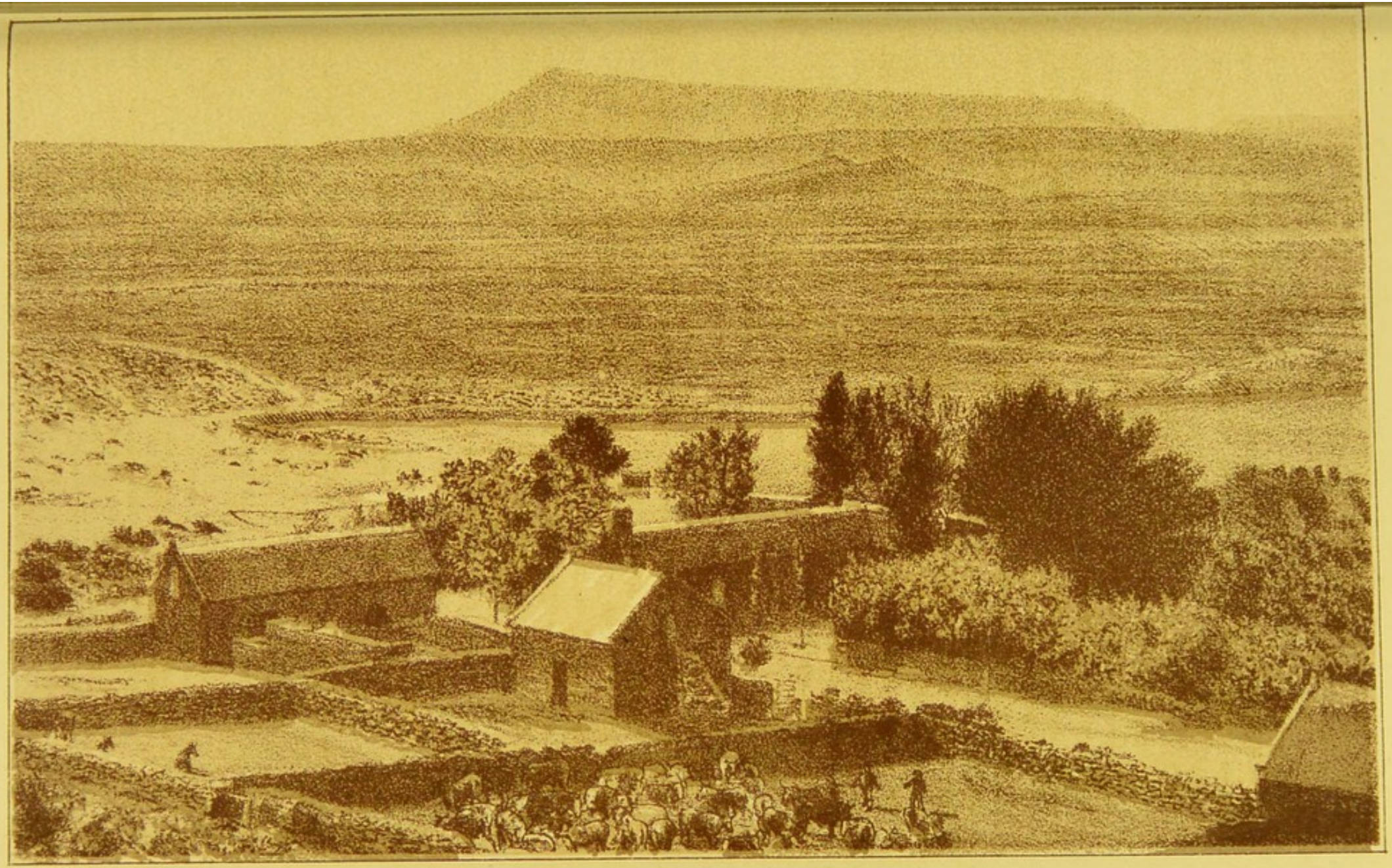
* "Banj," corrupted from "Verbannd," banished, mild form of swearing, as in Swedish "forbannade."

† A contributor writes to the *Graaff-Reinet Advertiser*:—It is a fact and circumstance worthy of remark, I think, that there has sprung up since the heavy rains in May last, all over the country, a most extraordinary, and, as far as I can learn, unprecedentedly luxuriant crop of countless millions of young seedling karoo bushes. Should one-fourth of this new crop attain maturity, it cannot but enhance the value of land for grazing purposes, by double its present worth. From personal observation I am led to believe that it extends over the whole colony in all its karoo districts, though it may not be so thickly studded in all as I have noticed it is in the Aberdeen, Graaff-Reinet, Willowmore, and part of the Jansenville and Uitenhage districts. This remarkable phenomenon is but one more surprising evidence of the wonderful powers of rejuvenation and renovation possessed by our arid-looking Karoo plains and barren hills, that have stood the wind's fiery blast and the sun's scorching rays for many and many a drought-stricken summer, even in the remote past; and still maintain their character as the best grazing grounds for all stock in South Africa, and perhaps equal to any other in the world.



SOLOMON & CO CAPE TOWN.

FARM ON THE KAROO PLAINS, NIEUWVELD. (FROM A PHOTOGRAPH BY MR FRIPP.)

even in good seasons it receives but seldom rain, which then generally comes down in torrents. The farmers therefore are mostly dependent upon springs (fountains), near which they build their homesteads, and grain can generally only be raised by irrigating the ground. The single farms are of large extent, and one to three and in some parts six morgen ground are required for each sheep. The average number of woolled sheep for small Karoo farms may be taken as about 1,500, but 3,000 is a common number, there are many of 7,000 to 10,000, and in the Beaufort West District there is one farmer, who owns as many as 20,000 sheep, and shears every year about 230 bales of well-grown and well-packed wool. This clip has been sold by the agents, Messrs. Wilman, Spilhaus & Co., Cape Town, for many years regularly for the American market, where it is well known and appreciated. As a rule the farming is done in a rough and ready way. The sheep are driven out in the morning and brought in again at sundown, to be kept during the night in rough enclosures, called kraals, erected sometimes of stones (the flat slate slabs are abundant in most localities), or built up of the sheep's own dung cut out from the floor of the kraals. This substance accumulates here rapidly, it becomes soon like hard baked peat, and is used extensively as fuel, a great boon in this woodless country. The sheep are of large build, much appreciated by the butcher, and the character of the wool is improved upon continually. In all the Divisions west of Victoria West, the universal custom is to shear once a year, although each farmer has his own particular time for this, modified often through dry weather and consequent poor condition of sheep. In the Midland districts the sheep are shorn mostly every seven or eight months, but in some of the north-eastern districts the more rapacious system of shearing twice a year prevails. Progress, however, is also noticeable in this respect, and in the Colesberg Division, as well as in Hope Town, many farmers are content to deprive their sheep of their fleeces only once a year. Generally speaking, the sheep yield from five to six lbs. average of unwashed wool, which will lose in scouring from 60 to 70 per cent. The wool is packed in bales, loose and mostly without locks and pieces being separated. The better clips of this wool, being of long staple, yellow colour and light in the grease, are eagerly bought up for the American market.

The divisions of Griqualand West with a portion of the district of Hope Town to the North West and the divisions of Aliwal North and Wodehouse to the South East of the Orange River Free State, complete the group of South African grazing-lands. Griqualand West has only lately embarked upon pastoral pursuits, yet numerous flocks cover the district already. In Hay alone the number of merino sheep is estimated at 70,000, for the other divi-

sions no estimates are available. The division of Hope Town has suffered much through drought. In 1875 its 305 holdings possessed 395,287 merino sheep, whilst now the number must be estimated at somewhat less.* In Aliwal North and Wodehouse the census returns of 1875 showed 628 holdings with 975,489 merino sheep. This number will at present probably not exceed 865,000, also owing to losses through drought. In these North Eastern districts like in the Free State the veldt is mostly a sort of prairie grass. Since some time however the Karoo bushes, transported by means of seed in the fleeces of the sheep, have commenced the invasion of this territory, and at present the character, at least of Griqualand West, is already essentially changed, numerous Karoo bushes covering the surface where before there was only grass.

In 1873, an interesting paper, contributed by Dr. Shaw, of this city, was read before the Linnean Society. He described some of the changes going on in the vegetation of South Africa through the introduction of the Merino sheep.

Seeds furnished with barbs and hooks have naturally the greatest chance of being sown out, through sheep, over large areas, and the author describes how, in an incredibly short period, the Xanthium spinosum, after being introduced through imported Merino sheep, spread over the country. It was threatening the very life of the wool-growing industry, but fortunately, through especial legislative enactments for its extirpation, it received a powerful check, and the war against it is still being carried on, not alone in this Colony, but also in the Free State. Another troublesome parasite on the wool is what is called, by wool buyers, the carrot seed,† the small hard seed, with numerous hooks, of a kind of herb. The more the intercourse between the several districts of this Colony increases, the more this seed is noticeable in the wool. The so-called burr weed, Medicago laciniata, whose seed does so much to deteriorate wool from the La Plata, is probably also introduced to this Colony through Merino sheep. In some parts there is a good deal of it, but as it is a plant that requires regular moisture, it cannot spread much in the Karoo districts. Besides the distribution of these plants, other changes are effected by the sheep. As their energy is foremost directed to those plants which form their best food, these naturally suffer most, and lose ground in the struggle for existence, and room is made for others which are less suitable as food. Thus, Dr. Shaw points out, the Gomphocarpus species have been favoured particularly, especially the G. lanceolatus, a plant indigenous to the midlands of the Colony, never eaten by any sheep, has come in consequence to cover extensive tracks of the country. In the same way the

* In the neighbourhood of Colesberg the loss by droughts is estimated at 25 per cent.
† Caucalis Africana Thunb.

Chrysocoma tennifolia has become the prevailing plant of late years, originally belonging to the S.W. of the Colony. It was first eschewed by sheep but is now in some parts their only sustenance, so much so that the mutton becomes impregnated with its rather pleasant aromatic flavour. The best Karoo Bushes are the Pentzia virgata and the Pentzia globosa, seed of which has been sent to Australia, also a species of Adenachaena; these are widely distributed over the lower Karoo. The Atripflex halimifolius and the A. capensis furnish also good pasturage for sheep. (The bot. names have been kindly supplied by Mr. Harry Bolus.)

The influences operating on the changes in the pasturage were aggravated by the system of overstocking which prevailed throughout the Colony (except in the S.W. coast districts), and it was feared at one time that the sheep walks of the country were gradually approaching their destruction. However, long years of drought intervened, the flocks were thinned out, all weak and delicate animals having to perish, and of the vegetation only what was really adapted to withstand rainless seasons could survive. Thus the most useful plants were preserved, plants that extend their roots to remarkable depths under the surface, whose seeds will remain germinable for many years, exposed to the hottest sun and to the severe cold of winter. What seemed a dire misfortune has been punishment and remedy at the same time, and where nature has provided so much assistance and so many facilities, it will now behove man to improve upon his opportunities. The South African farmer has his path clearly laid out for him, through care in selection of breeding animals, through the passing of energetic laws for the eradication of scab, through the fencing of his lands and through also improving his sheep runs by sowing useful plants, by giving them time to grow and by keeping down unsuitable vegetation, he can do much to improve his staple product and to enrich his country, and he *will* do it. Whatever may be said against our Afrikander Boer, slowly but steadily he advances, without the feverishness of the modern money-maker, but with the steadfast perseverance of his Batavian and Huguenot forefathers.

OSTRICH FARMING.

By Arthur Douglass, M.L.A.

From time immemorial the Ostrich Feather has been highly prized as one of the most beautiful productions in nature, and also as being different to all other feathers in having the fluff on both sides of the quill equal in length and quantity.

In early times they were much esteemed by knights and men of high degree as plumes for their armour, and have been especially prized by the English nation, from the time that the Black Prince at the battle of Crecy in 1346, having slain the King of Bohemia, plucked the plume of ostrich feathers from the deceased King's helmet, and placing it in his own, assumed it as the crest of the Prince of Wales, which it has ever since remained. In those days the feathers could be obtained only from wild birds in Northern Africa, but after the colonisation of South Africa, the wild Ostrich was found to inhabit the whole of Africa, though it is found in no other part of the world.

From the extreme shyness and great swiftness of foot of the Ostrich, and from its retiring rapidly into the Desert as colonisation extended, the export of Feathers from both North and South Africa remained on a small scale, and the article being in such limited supply could not come into that general use as a lady's head ornament, and for dress trimming, which of late years it has become, and for which purposes its intrinsic beauty must always insure it a pre-eminent position. It is only since the domestication, and consequently large increase of the importation of Ostrich Feathers into England, that we find it becoming a staple article of commerce.

The domestication and farming of the ostrich began in and has hitherto been confined to our Colony of the Cape of Good Hope. Up to 1864 it was commonly thought that the day was not far distant when the ostrich would be numbered amongst the extinct animals of the world. Already driven out of the better favoured parts of Africa, and compelled to live in the sandy desert, where, only in exceptionally good seasons, it could rear its young, whilst at the same time the hunters, both black and white, incessantly preyed upon the bird, it certainly seemed as though it must soon become extinct; more especially as the usual way of hunting them was to watch where they had made a nest, and then take advantage of their sitting on the eggs to steal up near enough to shoot them. But all this was about to be changed. In the place of ladies being adorned at the cost of the destruction of these noble

birds, a new industry was to be given to the world, another animal added to our domesticated list, and new life and vigor thrown into our farming population at the Cape; an industry that would cause large tracts of country to be fenced in, that would give the more intelligent and enterprising of our farmers an opportunity to rise to the surface, and would bear fruit in a hundred ways, by inducing men to look round and search in other directions for the latent wealth that lies in South Africa, only wanting development.

About 1864 two farmers in different parts of the Colony had succeeded in capturing some wild Ostrich chicks, and it was found there was no difficulty in getting them moderately tame, sufficiently so to allow them to be kept in a well fenced paddock, and to allow of their being caught twice a year and their feathers removed. But old hunters and travellers from the interior, all prognosticated that any attempts to breed them in a tame state would prove abortive, it being commonly said that so shy was the Ostrich, that if the nest was once seen by man, the bird would never return to it. But this and many other difficulties in the successful domestication of the Ostrich were to be solved in a manner then never dreamt of, and a foundation laid to a complete change in the nature of the bird, and from being the shyest and most timid of all birds, to make it in a few years as tame and easily farmed as any of our domesticated animals.

In 1865 we have the first record of the tamed but not yet domesticated ostrich being farmed. In the census of the Cape Colony taken in that year, we find in the return of live stock in the Colony 80 ostriches. The total export of ostrich feathers in that year being 17,522 lbs. weight, valued at £65,736, these being feathers entirely from wild birds, with the exception of 120 lbs. weight from the above noticed 80 tame birds. At about this amount the export remained, little progress being made in the domestication of the birds, till in 1869 Mr. A. Douglass, of Heatherton, in Albany, succeeded in perfecting an Incubator and hatching the eggs in large numbers, thus solving what had hitherto been the great difficulty to successful ostrich farming. Previous to this, the few birds that were hatched, generally got wild and unmanageable, but the successful development of Artificial Hatching at once gave an impetus to the industry, and the export of feathers the following year rose to 28,786 lbs., valued at £91,229.

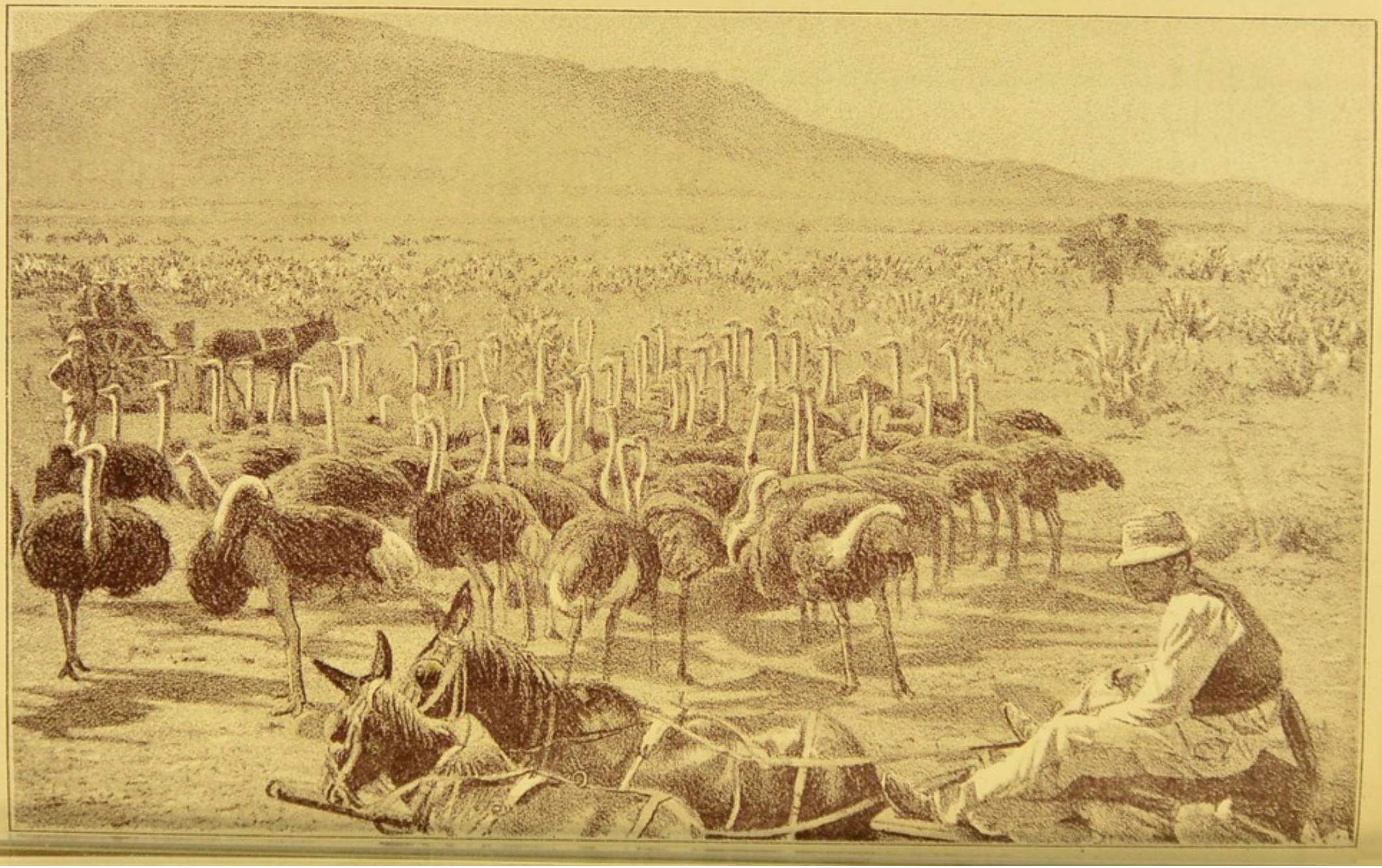
The industry was now fairly started, artificial hatching entailing artificial rearing; this again caused a close study of the wants of the birds, and the knowledge thus acquired enabled those farmers who did not hatch artificially to remove the chicks from the parent birds as soon as hatched, and rear them by hand. Thus they became rapidly free from the innate wildness that had

hitherto been the great drawback to successfully farming them. each succeeding generation showing more and more signs of perfect domestication. The result was that in 1875, five years later, the export had risen to 49,569 lbs. weight, valued at £304,933. In this year (1875) a census was taken of the Cape Colony, the return of live stock shewing 21,751 domesticated ostriches, as against 80 at the beginning of the decade.

The next five years saw the production of feathers rise rapidly, the export in 1880 being 163,065 lbs. weight, valued at £883,632. At this time the industry was most lucrative, pairs of birds that had already bred, or that were sold with a guarantee that they would breed, realised readily £200 a pair and upwards, whilst as high as a thousand pounds was in more than one instance given for particularly well known birds of superior plumage, and £10 each was the standing price for chicks a few days old. This state of things induced a mania for Ostrich farming, everybody who could scrape money together plunged into it. Companies were formed in every town and village. And the talk on the market or in business offices would be all of Ostriches and their requirements: the Doctor and the Lawyer, the Baker and the Barber, each vying with the other as to who could speak most learnedly on the subject. But, alas! for frail human nature, how quickly, and to their sorrow, did these gentlemen discover what a deal of truth there is in the old proverb "every cobbler to his own last." When the money was invested and it was too late to retrace the steps, it was found that the successful management of Ostriches was a delicate matter requiring knowledge and experience, and above all close personal supervision.

The highest export return as to quantity of feathers yet reached was in 1882, when the export was 253,954 lbs. weight, valued at £1,093,989, but the next two years showed a decrease in both quantity and value, the last returns published being these for 1884, showing a decrease of 20,543 lbs. in weight and £127,510 in value. This decrease in the export being mainly owing to drought and a virulent fever that of late years has attacked and carried off large numbers of the chicks when about a month old, and which promises to put a check to any further rapid increase in the number of domesticated birds.

This check to the hitherto rapid increase of Ostriches is not altogether to be deplored, as the increase had before been at a rate that was certainly alarming as to the stability of the industry, and the heavy fall in the value of feathers that has just occurred, showed that to some extent production was exceeding demand. But it should be borne in mind that production has exceeded demand in everyone of the principal articles of export from our great Colonies, and this, taken in conjunction with a temporary



turn of fashions against Ostrich feathers, fully accounts for the heavy fall, and should prevent anything like a panic as to their future value.

There having been no census taken since 1875, the number of Ostriches in the Cape Colony at the present time is not exactly known, but taking the known production of an Ostrich to be 1½ lbs. of feathers in a year, allowing eight months between each crop, and dividing this into the total weight exported in 1884, after deducting the small amount of wild birds' feathers still exported, we get a return of 150,000 domesticated Ostriches living in the Cape Colony at the present time, giving employment to not less than eight millions of capital.

A VISIT TO AN OSTRICH FARM.

We can imagine nothing more delightful and interesting to a traveller than a visit to a large ostrich farm. Let us try and describe what may be seen on one we know well. The size of the farm is 13,000 acres, situated in the Eastern Province of the Cape Colony. The herbage is a mixture of grass, Karoo (a sort of heather) and succulent bushes. The rainfall in this part of the Eastern Province is too uncertain to allow of cultivation without irrigation, so the cultivation is confined to a few acres of lucerne irrigated by pumps, some soft green food being indispensable for rearing the little ostrich chicks during droughts. On the farm are kept 600 ostriches and 400 breeding cattle. The whole property is enclosed by strong wire fences 5 feet high, and sub-divided into numerous camps, with similar fences. Near the homestead the camps are of about 100 acres each, being appropriated to the rearing of the young birds. Beyond these again are camps of about 25 acres each, these being given up to a single pair of superior old birds in each camp for breeding, whilst beyond these again are large camps of about 2,600 acres in extent, with 150 birds in each. But let us take a stroll in these camps and see what is going on. Here in the first we find an old Hottentot with about 30 little ostriches only a few days old around him, these have all been hatched in the Incubator, and he is doing nurse to them, cutting up lucerne for them to eat, supplying them with fine gravel to fill their gizzards with to grind their food, breaking up bones for them to let them get a supply of phosphates, and giving them wheat and water, and at sundown he will bring them back to the Incubator for warmth, or should the weather change and rain come on he will be seen hurrying home with his 30 little children following him to a warm well lighted room, with a clean sanded floor. In the next camp we have a pair of birds and about 15 chicks accompanied by a Kaffir man, who has been with them every day from the time they hatched to get them tame and accustomed to man. These have

been hatched by the parent birds who will brood them at night in the camp. But great risks are run by this method of rearing, from wild carnivorous animals catching the chicks, as great number of carnivorous animals of nearly every known species abound in South Africa, the most destructive to young ostriches being the jackals, a single one of which will destroy a whole brood in a night. Our host informs us that he is compelled to keep a man constantly employed laying poison and setting traps. The poison is laid by inserting strychnia in pieces of meat and laying the pieces at short distances all round the camps. In consequence of this wholesale destruction of the carnivara, game abounds on the farm, and as we walk beautiful antelopes of different kinds are constantly springing up and bounding away in front of us, and in the afternoon our host lends us a rifle and taking us into some unoccupied camps we bring down our first buck.

But here we come to another camp in which we are told there is a nest, and as we enter a heavy thorn bush is given to us, and we are told that if the male bird charges we are to hold it to his eyes. But we do not see the cock bird, and have got some distance in, and can just see the hen bird upon the nest with its neck stretched along the ground, making itself look as much as possible like one of the monster ant-heaps that abound in the country, when we are startled by three tremendous roars behind us, and only just have time to put up our bush, when the infuriated cock charges down as fast as a horse can gallop, making every nerve in our body shiver with fear, as we remember having heard of broken ribs and legs, and men killed by savage male birds; but we follow the example of our conductor and keep the bush at a level with the bird's eyes, when just as he reaches the bush he stops suddenly, his instincts teaching him not to risk his eyesight against the thorns. Then we move on to the nest keeping the cock at bay with our bushes, but we are thankful when it is over, as the cock dodges round us, first on this side then on that, always trying to get his head past our bush, and should he succeed, he would instantly floor us with a kick from his foot, armed as it is with the formidable horny nail. The kick is delivered forward and downwards, and with immense force when at the height of a man's breast, gradually losing its force as the foot nears the ground, in consequence of which many men have saved their lives when attacked unprepared, by lying flat on the ground, thereby escaping with a severe trampling, but no broken bones.

We, however, arrive at the nest without accident, when to our astonishment our conductor suddenly lays his bush down, and handles the eggs, when we find that the hitherto infuriated cock's nature has quite changed; he that a moment ago was trying with all his might to get at us and kill us now stands a dejected, beseeching

creature, uttering a plaintive noise and beseeching us in every possible way not to break his eggs. The nest we find to be merely a scratched hollow in a sandy place, with 15 eggs in it, weighing three pounds each, upon which the parent birds must sit for six weeks, the cock sitting by night and the hen by day, the eggs being exposed to many risks of destruction by jackals, baboons and carrion crows, or by heavy rains filling the nest with water. The "modus operandi" of the carrion crows to get at the contents of the eggs is very ingenious; the bills are not strong enough to break the shell, so they take a good-sized stone in their claws and rising up to a considerable height, let it drop on the eggs, but unless there are suitable stones near the nest they cannot do this, seeming not to be able to carry the stones horizontally. We have noticed the same peculiarity of a want of power in the crow to carry horizontally when trying to get at a tortoise by letting it fall to break its shell; in every case where we have seen them do it, they have caught the tortoise on a rock, in no case have we known them to carry the tortoise till they get over a rock.

But now we arrive at one of the large camps with a troop of 150 full grown birds in it, and here in the corner we have a planked yard: this is where the birds are plucked, the one end being movable, so that when the birds are in, the end can be moved up and the birds packed in so closely that they have no room to kick. Just as we enter, we observe the birds coming over the hill, being driven on by ten men on horseback, each man carrying his thorn bush to turn a refractory bird, or to master a savage cock. The birds being yarded the plucking begins, the tails and long black and drab feathers are pulled out, the white feathers being cut off and the stumps left for two months, till the quill is ripe, this being done to get the feather before it is damaged, and the quill being left in so as not to injure the socket by pulling it before it is ready to be shed.

We now return to the Homestead and visit the Incubator room, which is constructed to be as little affected by changes of temperature as possible. The machines used are the "Douglass" Patents. Then we visit the feather room and see the feathers being sorted into the different qualities, and done up in bunches, either for sale in the Colony or for shipment to England. We then visit the kraals, and find some 70 or 80 cows being milked, as dairy farming can be most successfully carried on in conjunction with Ostrich farming; the cattle eating the coarser grasses, and tending to keep the bush from getting too thick for the Ostriches to pass amongst it. We find all the labor on the farm is done by natives, who make excellent servants for managing stock, and as the natives are exceedingly fond of milk, the Ostrich farmer who has an unlimited amount of milk to give them,

greatly reduces the cost of their food, and makes them contented and happy.

Such are shortly some of the sights with many variations that may be seen on an ostrich farm, whilst the visitor will probably be regaled at dinner with a luscious omelette made from an Ostrich egg, or he may be asked to have a slice of roast Ostrich, the meat being very good eating though as yet little used.

VALUE OF OSTRICH FEATHERS.

The following table showing the value per lb. of all Ostrich Feathers exported from the Cape, given at quinquennial periods, may prove of interest. It must be borne in mind that they are average values of all kinds of Ostrich feathers exported, including "Dark Chicks" worth 2s. per lb., and "Prime Whites" worth very many pounds per lb.

	£	s.	d.
1850, Average per lb.	3	13	0
1855 „ „	6	0	0
1860 „ „	8	8	0
1865 „ „	3	14	0
1870 „ „	3	1	0
1875 „ „	6	3	0
1880 „ „	5	8	0
1884 „ „	4	2	0

1884 is the last year for which the Customs return at the Cape are completed.

In concluding this short notice of Ostrich farming, we must remind our readers that the Cape Colony, as it was the first to domesticate the ostrich, so has it hitherto had a practical monopoly of the Industry. But in 1883 several shipments of ostriches took place to South Australia, the Argentine Republic, and to California; and the Cape Parliament taking the alarm that the Colony was in danger of losing its lucrative monopoly, imposed an export tax of £100 on every ostrich and £5 on every ostrich egg exported.

GREAT CONSTANTIA WINE FARM

VITICULTURE OF THE COLONY.

By Professor P. D. Hahn Ph. D., M.A.

Shortly after the arrival of the first European settlers in Table Bay, the first vine-sticks were brought into the Colony, in 1653, from the borders of the Rhine. They appear to have flourished rapidly, and many more sticks were brought in 1656, principally from the Rhenish provinces and France. The earliest account of a vintage is from the muscadel grape in 1659. In 1681 the first brandy was made, and ever since those days viticulture has occupied the most prominent position amongst the several branches of Agriculture in the Cape Colony.

According to the returns of the first census taken at the Cape in 1687, the total number of the vines planted in the vineyards of the settlers, and in the government plantations, was more than half a million. It has been thought that the Huguenots brought with them the art of viticulture, and the varieties of vines which are now found in the Colony to be principally cultivated. This is not so, as the Huguenots only arrived here in 1688, and twenty-five years earlier the first cuttings were introduced from Germany and France. It was certainly hoped that the skill of this people would improve the character of the wine, and they have done very much towards improving the ways of growing and making wine in the Cape Colony.

The last statistical returns of the vineyards of the Colony, taken in 1880, shewed that there were about 60,000,000 vines in the Colony on 20,000 acres of land. A large number of vineyards have been laid out since that time, and there is reason to believe that the number of vines now in the Colony exceeds 70,000,000.

The cultivation of the vine is not met with in all parts of the Colony. Most of the wine districts are in the Western Province; the production of wine and brandy in the Eastern Province being comparatively small. This is not so much due to the fact that the first wine-growers settled in the western part of the present Cape Colony, or that for a long time the western part of the Colony formed the principal part of the European establishment, but principally to climatic conditions. There is certainly no country in the world which possesses a climate more favourable to the cultivation of the grape, than the Western Province of the Colony. Here we have in spring a sufficient number of fine days with bright sunshine, and also as much rain as will cause a very vigorous development of the buds, and a most luxuriant growth of the young

shoots. Towards summer, bright sunshine reigns supreme, but the humidity of the air is still sufficient for the further growth of the bunches, which in January and February mature under an almost cloudless sky, and in a tropical temperature. Only certain parts of California, and of Southern France, enjoy a climate which is similar—but not equal—to that of the Cape. The enormous production of the vineyards of the Cape, to which reference is made below, is solely due to the climate; it is true the soil is also fertile, but it is not superior to the soil in other wine-producing countries.

The principal wine districts are the divisions of the Cape, Stellenbosch, Paarl, Malmesbury, Worcester, Robertson, Montagu, Ladismith, Prince Albert and Oudtshoorn; the production of wine and brandy in all these districts is by far the greater portion of the total yield of the Colonial vineyards. They may conveniently be distinguished as coast districts and inland districts, inasmuch as the physical condition and chemical composition of the soil, and also the climatic conditions in these districts, are so different as to compel the wine-farmer to adopt two different ways of cultivating the vine in these districts. The divisions of the Cape, Stellenbosch, Caledon, Malmesbury, and Paarl, exhibit a great similarity in soil and climate, and form the group of the coast districts, whereas all the other abovementioned divisions may be called the inland districts. The rocks which contribute towards the formation of soil in the coast districts are granite, clay-slate, and sandstone. The vineyards situated on hills or slopes in these districts are all on granite; the best vineyards in these districts, such as those of Constantia, Bottelary, Moddergat, Jonkers Hoek, Paarl, Groeneberg, and Riebeeks Casteel, are all on decomposed granitic soil, and there is no doubt that the produce of these vineyards is qualitatively superior to the wine produced in lower situations. The alluvial soil in the coast districts is formed from the constituents of granite, clay-slate and sandstone, and is found along the courses of the Kuils, Eerste, Laurentz, and Berg River vineyards, on stiff yellow clay, on rich black clay, on sandy clay soil, and even on loose sand. The greatest difference in the physical properties, and in the chemical composition, may be observed in these vineyards, but in all these districts the soil is distinguished by a very small amount of lime. This want of lime is the characteristic feature of the soil in all the vineyards in the coast districts. Numerous analyses have been made of these soils, and the results of all shew that the amount of lime in these wine districts is deficient, seldom exceeding ·1 per cent. Many wine farmers have adopted a system of manuring by which they supply the soil with this necessary ingredient, and their method has always been rewarded with excellent results. As a rule the vineyards in the coast districts are not irrigated, and this must be

attributed to another important constituent of the granite soils, the ferruginous clay, which possesses a most peculiar power of retaining moisture, whereas the porous sandy soils, or the loose calcareous soils of the inland districts readily part with the moisture they contain, and therefore these soils require irrigation. The rainfall in the coast districts is much greater than in the inland districts, and the maximum rainfall is during the winter months. It is evident that this latter circumstance is most favourable to viticulture.

The returns of the Meteorological Commission give the average rainfall of Wynberg (Constantia district), Somerset West (Stellenbosch district), and Wellington (Paarl district) as follows:—

	Wynberg. Inches.	Wellington. Inches.	Somerset West. Inches.
January	¾	½	⅗
February	⅚	¾	½
March	⅘	1⅐	1⅙
April	2⅓	1¾	1½
May	6⅙	4⅓	3⅗
June	7¾	3⅓	4⅕
July	7⅙	3¾	4¼
August	6½	3½	2⅔
September	4¼	2⅙	2⅛
October	3	2½	2 1/10
November	1⅘	⅘	1
December	⅙	1⅓	¾

Some time before the winter rains set in the grapes are ripe, and it is quite exceptional that the crops suffer from rain. The great difference in the rainfall between the coast and inland districts is not the only cause of the different method of cultivating the vineyards in the inland districts. The physical condition and the chemical composition of the soil of the vineyards in these districts are most peculiar, and are the cause of the enormous production, which is greater than in any other part of the world. A bed of ferruginous marl, the so-called "kalkbank," stretches for miles and miles almost at the same level through the lowlands of the districts of Worcester, Robertson, Montagu, Ladysmith, and Oudtshoorn. It commences on the Hex River and extends along the Langebergen as far as Cogman's Kloof. The whole belt of land between the Langebergen and Zwartebergen, from the Koo to Meiring's Poort, is characterised by the occurrence of this "kalkbank." The ferruginous marl frequently changes into calcareous clay, which readily decomposes, forming a very rich, loose, and deep soil. The value of this soil is, even in the Colony, not sufficiently appreciated, although there cannot be any doubt about the fact that no more fertile soil can be found throughout the length and breadth of South Africa.

The methods of cultivating the vineyards are different in every district, each farmer having his own ways; it is therefore quite impossible to give an accurate description of the planting and growing of vines in the Colony. The following account contains the recommendations to the wine farmers of the Colony from Seb. van Reenen, Esq., of High Constantia, who is undoubtedly the most experienced wine farmer in South Africa. These recommendations have been acted upon by most of the more successful wine farmers, and they can testify to the practicability of the same. His recommendations are as follows:—

The season for planting depends much on circumstances, in this country, generally in the month of July; but if possible, it should always be done as soon as possible after separation from the parent stock; the cane has thus a chance of making a first growth in its future home, instead of leaving it to exhaust its force while laying in the ground as a cutting, and necessitating a fresh effort when permanently planted.

Very much of the future success of a vineyard depends upon the care with which the planting is done. A good start will not only ensure a more healthy and vigorous plant, but greater longevity; to secure this, deep trenching is essential, however rich may be the soil, to enable the young roots to strike well down. The trench should not be less than two to three feet, three feet is better, as the canes, which should not be less than 18 inches in length, will thus with facility strike deeply down, and have freer rooting ground; if the soil be poor, some manure should be placed at the bottom of the trench; the distance between the canes depends much on the variety of the grape, as well as the aspect of the vineyard; in a hot district, it is admissable to plant closer, but, generally speaking, four by four feet is a safe distance; also in very rich soils, and for luxuriant growing vines, even more space is desirable.

For the two first years especially, the young vines should be kept scrupulously clean; a very general error is committed in occupying the ground during this time with melons and vegetables of various descriptions, thus improverishing the soil at the very time the young vine requires every aid, besides the evils of necessarily treading the ground, and injuring the young sticks in gathering the temporary crops, and further preventing that careful and diligent hoeing, which is so essential in giving free access of air to the soil, and permitting the spring rains to carry down the fertilizing matters.

The young vines should not be pruned or interfered with the first two years, so as to enable them to give as many shoots as possible: it is erroneous to suppose that earlier pruning ensures a quicker return, as, even if it does, it is at the cost of the future strength of the plant, in fact its free growth in infancy necessitates an extraordinary root action, which insures ultimately a far more vigorous growth and vine; when the vine is pruned, say, the third year, the first care should be the formation of a well shaped stock with a single trunk, and four or five arms radiating as nearly as possible from a common centre, so

as to ensure an even supply of sap to all the future arms, and acquire the cup-shaped form.

The attainment of an early harvest should always be subordinate, as the vines when once well cut for fruit spurs, will yield a return far beyond what can be gained by an early crop. It is now that the advantages of deep trenching will be manifested, as the plant, thus enabled to root itself deeply, will evince the greatest vigour and luxuriance. There is another practice which must be condemned, viz: shallow trenching and irrigating, the result of which is that the roots are kept near the surface, instead of striking down towards moisture, which by capillary attraction a deeply loosened and porous soil will always furnish.

Digging.—All vines are benefited by digging, even though the soil be porous and loose, but this should be finished in the month of May, as digging and pulverizing the soil towards the end of winter tends to favour the increased productiveness of insect life, especially of the Calandra. The scarcity of labour has led to the practice of ploughing, and with very ill result, the subsoil becomes hardened by the horses' hoofs, and in addition the plough continually passing at a uniform depth, causes a hardening of the subsoil, from the flat bottom of the iron share constantly pressing it down, and further, with a careless leader or driver, an immense number of arms and shoots are destroyed. A good many instruments have been invented for hoeing, but the hand-hoe is by far the best; if a grubber, or horse-hoe, be desired from motives of economy, it should be so light that a donkey can draw it; the heavy foot pressure of a horse is very injurious in the freshly dug and moist rows of a vineyard, especially if the soil be tenacious.

Pruning.—We need hardly say that at all periods this should be done by experienced hands with a sharp knife or scissors: it is marvellous how vines can at all sustain the rough treatment of a club-stick or hatchet, with which the young branches are too frequently broken off. The vine when three years old, may be said to have fairly entered on its bearing career, but it does not the less require diligent care and skill, in fact the operations of nature in every form resent neglect; too much care and attention can hardly be bestowed on the pruning, from the age the vine is now supposed to have attained; bad pruning affects both quantity and quality of the crop, impairs the vigorous growth of the plant, and leads to premature decay.

The pruning should, we repeat, ensure an open space in the middle of the stock, to admit of free ventilation, without which the fruit cannot well mature even if it escape the other ills consequent on faulty work; the arms should, as before said, be three or four in number, branching from a common centre; they should then be trained somewhat horizontally, and then pruned, so as to get the fruit spurs perpendicular; those fruit spurs must be left from the current year's growth, and have only two eyes each; if this number be adhered to, the young shoots will be strong and healthy, the lower bud will give the thickest shoot, which will serve for the succeeding year's pruning, and thus give a short jointed wood, and consolidated well set stem; whereas, if three or more eyes be left the uppermost will form the stoutest

cane, and be selected for the next year's pruning, as the fruit spur, the effect of which will be long-jointed wood, the internodes being thus thin and weakly instead of stout and well devoloped, as in the result of the two-eye system. By this treatment the vine is kept vigorous, and may attain the age of 100 years while the three-eye system will give a lanky tall vine, without the same robust wood, and may very probably fade off, or become what is termed diseased within twenty years. Some varieties, however, as the green grape, must be cut somewhat longer than others, but the viticulturist must aim at ensuring a robust stem, and a paying result will necessarily fellow.

The operation of pruning should be carried out at two distant periods, the first commencing directly the vintage is harvested, and continuing to the 15th May: this is called early pruning, and consists of the removal of all unnecessary shoots and suckers. The second operation is termed the fruit pruning proper, and should be commenced as soon as the buds begin to swell, and varies, according to the different sorts of vines, soils and aspects; this fruit pruning consists in cutting the canes back to two eyes from the old wood. The reason why early pruning should be finished by the 15th May, is that the albumen setting in Autumn, heals the wounds and prevents any rotting in, which destroys the sap channels and consequently impairs vigorous growth.

We have so frequently insisted upon the importance of keeping a vineyard clean and free from weeds, that there is not much left to enforce on this head; it is most essential that this work be well done.

Sulphuring.—This important and efficacious work is happily very simple, and only requires care. Well constructed bellows are alone permissible, all other devices are attended with more or less failure, but with a good instrument and attention, not a single berry need be lost; to ensure success, sulphuring must be commenced at the earliest stage of development, *i.e.*, when the shoots are about six inches long, and repeated every ten days, until the grape has coloured. This constant application will keep a vineyard free from disease, and is necessary where oïdium is generally virulent and where dew falls: in such cases an imperfect sulphuring not only loses the crop of that year, but the wood and buds are so much affected that the evil only passes off after two years; such copious dressing may only be necessary in exceptional cases, but it should be borne in mind that a moderate excess is in any case a stimulant to the vine, while a too sparing application is fatal to the crop when the disease has once appeared; dry weather must always be chosen for the work, and not too much sulphur applied at one time. A careful man will soon learn to take advantage of the gusts and currents of air, so that a light coating be spread on all parts of the vine, particularly on the shadiest and densest portions where the disease is invariably first manifested.

Manuring.—The materials which are being used as manure for vines are of a most different nature. Pure animal manure of horses, cattle, and sheep is used by some though it is often condemned by others, and the same is the case with manure composed solely of vegetable substances. Colonial viticulturists also differ in their opinion as to guano

and artificial manures. The nature of the vineyard manure is, however, greatly dependent on the nature of the soil. Guano may, for instance, be used with great success in a soil containing all the necessary fertilizers in sufficient quantity, whilst it will prove ruinous in a soil which is lacking in the one or other of the necessary fertilizers, which is not at the same time contained in the guano itself. In this case, the guano acts as a powerful stimulant, in the first and even in the second year, but in the third year the equilibrium between the quantity and quality of the fertilizers of the soil available to the plant, is disturbed to such an extent, that it can only be restored by an expensive and careful treatment during many years.

The best manure for the vine is a well decomposed compost of vegetable substance and animal manure. But it must always be remembered that ammoniacal ingredients, as chiefly supplied by animal manure, are apt to produce too great a development of shoots and leaves, and too much albuminous matter in the juice of the grape, which, later on, will interfere with the good qualities of the wine.

The materials which may be used for making a good vineyard manure are: cuttings and leaves of the vines, grass, straw, and ashes; further, all kinds of animal manure, such as that of cattle, horses, sheep and fowls; all sweepings from the yard, ditches, roads, &c; bones, burnt and unburnt; in short, every kind of refuse of vegetable and animal matter. Before these materials are used they must be thoroughly mixed and decomposed.

There ought always to be at least two compost heaps on a wine farm, the one almost ready for use, or containing the materials collected the year before, the other in preparation. A rectangular hole of about 10 yards by 20 yards and two yards deep, is first constructed on a place on a farm which allows the urinary excrements of the stables, or, if there be not any stable, occasionally water, to run into it. The above named materials are stratified with thin layers of earth until the hole is filled, and left from three to four months, during which time the materials are frequently wetted, so as to allow a thorough decomposition to set in. The contents are after that time thoroughly worked up and mixed and covered once more with a thin layer of earth to prevent the escape of volatile matter. It is then left for another twelve months, whilst the second heap is in preparation. After that time it is once more thoroughly worked through, and is then ready for use.

It is evident that on farms where much material is to be had, three and four of such compost heaps may be prepared. This compost generally forms a dark loose powdery mass, which contains all the fertilizers for the vine in the proper condition, and at the same time much improves the physical character of the soil. Manure prepared in this way will on the one hand be found superior, by its immediate effect, to any other, and on the other hand by not deteriorating the soil in course of time as, for instance, guano often does.

There are few varieties of natural soil which will continue to yield fruit for years without being improved or manured. Some soils will, however, continue to yield for a longer time than other soils,

which have not had the same quantity of manure put upon them. A sandy soil will need manuring much more often than a clay soil. Again some varieties of vines require more manure than others. The cultivator being satisfied as to the required constituents, and the composts being ready, it may be arranged that an interval of three years should elapse between one manuring and another. The fact, however, that vines have their main roots two feet or eighteen inches below the surface, at once indicates where nourishment is most needed. The main roots of the vine must be kept up to the mark. In order to effect this the manure must be put some distance below the surface of the soil. This just suits our climate, for the south-east wind has such a dessicating power, as to dry up several inches of the upper soil, even in spring. The manure, therefore, if placed near the surface would be useless; it is consequently desirable to place it *at least* six inches under the surface, where no dryness can affect it, and from which depth of the soil no volatile matters can escape into the atmosphere, and thus be lost. The best plan is to make a square hole in between the vines, and sufficiently wide and deep to contain a bushel of manure. This being placed in the hole is levelled, and then covered with a slight layer of earth; as the rains descend during winter, the water rushes into the half filled holes, and washes out the soluble matter, carrying it down to the main roots. Meantime, throughout the whole winter, the surplus soil has been exposed to the action of wind, rain, and sunshine, and consequently considerably improved. This then is put into the hole, and spread on the surface in spring, and adds to the fertility of the soil. If this plan be adopted, and the vines manured every three years, it naturally follows that twelve years must elapse before the roots need be touched again, for the vines being planted four feet by four feet, and in lines at right angles to each other, it follows, if the holes be changed at each manuring at intervals of three years, it would be just twelve years before the roots would be disturbed again, by which time they will have exhausted every particle of nutriment contained in the manure. The best time to manure is in autumn, and as early in autumn as possible, in order that the rains may wash out all that is soluble and furnish the plant with food, so that, when spring comes round, it may be in full working order. Late manuring is detrimental to the vine, unless especially prepared and very soluble.

The production of the vineyards of the Cape Colony surpasses as to quantity and quality that of any other wine-producing country in the world. This statement will be readily understood and accepted by the reader who pays some attention to the following figures. The average annual yield in the Cape, Stellenbosch, Paarl and Malmesbury districts is $1\frac{1}{2}$ leaguer per 1,000 vines; expressed in continental measures this yield is equal to $86\frac{1}{2}$ hectolitres per 10,000 vines, which are as a rule planted in Europe on 1 hectare of land, a square of which the side is 100 metres. If 1,000 vines yield $1\frac{1}{2}$ leaguers at the Cape, 10,000 vines will yield 15 leaguers; as 1 leaguer of 127 Imperial gallons is equal to a very little more than $5\frac{3}{4}$ hectolitres, 15 leaguers are equal to $86\frac{1}{2}$ hecto-

litres, and this quantity is the average yield in the coast districts in the Colony. In the Worcester, Robertson, Montagu and Oudtshoorn districts, the yield is generally 3 leaguers, and even more, per 1,000 vines, which corresponds with 173 hectolitres per 10,000 vines. The writer of this knows many farmers in the Worcester, Montagu and Ladismith districts, who year for year obtain as much as 5 leaguers from 1,000 vines, which amounts to the fabulous quantity of 287 hectolitres per 10,000 vines. This enormous, and for the European wine farmer, incredible production of the Cape vineyards, is of course a source of wealth to the Colony, but if it be remembered that only a small portion of the area which is suitable for viticulture is under cultivation, it is obvious that no country offers the same chances to intending viticulturists as the Cape Colony. If we compare the gigantic production with the yield of the vineyards in other parts of the world it will become still more evident that the Cape Colony is the wine-producing country *par excellence*.

The following table gives a comparative statement of the production of wine per 10,000 vines, or per 1 hectare, in the chief wine-producing countries in the world. The figures are taken from the standard work on viticulture, by Baron von Babo of Klosterneuburg, near Vienna, who is the first authority in Europe on matters referring to viticulture.

Hungary 1861-1872	24 hectolitres per hectare.
Germany	24 ,, ,, ,,
Austria 1874-1880	18½ ,, ,, ,,
Switzerland	42 ,, ,, ,,
France 1873-1883	18¼ ,, ,, ,,
Italy	14½ ,, ,, ,,
Spain	17 ,, ,, ,,
Greece	17¾ ,, ,, ,,
Algeria 1882	25½ ,, ,, ,,
United States	14½ ,, ,, ,,
Australia	14½ ,, ,, ,,
Cape Colony, Coast districts	86½ ,, ,, ,,
Inland districts . .	173 ,, ,, ,,

The productive power of the vineyards of the Cape greatly exceeds that of any other viticultural country in the world: in no country in the world can there be raised from the same area an amount of wine equal to that raised at the Cape. It is not necessary to say more regarding these figures, they speak for themselves! As has been stated before, the quality of the juice of the Cape grapes is also superior to that of the European grapes. In support of this latter statement the following table is added, which contains the results of determinations of sugar and acid in the juice of the different kinds of grapes from almost all the principal wine districts of the Colony:—

HAANEPOOT GRAPE.

Date. 1884.	Name of Farmer.	Locality.	Acid. per mille.	Sugar per cent.	Specific weight
Feb. 19	E. Atherton	Dal Josaphat, Wellington ..	4·06	17·3	1·085
,, 25	A. Brink	Boven Vley, do. ..	3·6	20·3	1·101
Mar. 4	A. Marais	Paarl	3·6	20·7	1·103
,, 4	J. H. L. Minnaar ..	do.	4·07	17·7	1·087
,, 4	P. C. le Roux ..	do.	3·7	15·8	1·077
,, 8	R. v. d. Merwe ..	Hex River	..	15·2	1·074
,, 12	D. Hugo	Riebeek's Casteel	3·8	19·2	1·095
,, 12	D. Roux	do.	4·5	17·3	1·085
,, 12	A. Steyn	do.	..	20·1	1·100
,, 15	W. Meiring, jun. ..	Hex River East	..	18·2	1·090
,, 15	L. Viljoen	do.	..	18·0	1·089
,, 15	M. de Vos	do.	..	16·3	1·080
,, 15	M. de Vos	do.	..	18·4	1·091
,, 17	P. C. v. Blommestein	Montagu	..	18·8	1·093
,, 17	A. Joubert	do.	..	17·3	1·085
,, 17	J. Malherbe	do.	..	17·9	1·088
,, 17	W. Upton	do.	..	18·8	1·093
,, 17	G. J. v. Byl	do.	..	18·6	1·092
,, 25	Widow de Villiers ..	Stellenbosch	..	22·3	1·112
,, 29	M. de Vos	Hex River East	4·0	17·3	1·085
April 24	S. v. Renen	Constantia	4·3	23·0	1·116

Average Acidity, 3·9. Average Specific Weight, 1·090.

FRONTIGNAC GRAPE.

Mar. 15	M. de Vos	Hex River East	..	17·9	1·088
,, 26	S. v. Renen	Constantia	4·0	27·2	1·136
,, 26	S. v. Renen	do.	4·03	24·7	1·125

STEIN GRAPE.

Mar. 26	S. v. Renen	Constantia	4·3	21·0	1·105

RIESLING GRAPE.

Mar. 26	S. v. Renen	Constantia	4·4	20·7	1·103

GREEN GRAPE.

Feb. 14	Enslin	Paarl	4·3	20·7	1·103
,, 14	J. D. de Klerk ..	Klein Drakenstein	5·08	20·7	1·103
,, 14	J. H. L. Minnaar ..	Paarl	4·1	21·6	1·108
,, 14	J. J. le Roux ..	do.	..	19·6	1·097
,, 19	Atherton	Dal Josaphat, Wellington ..	3·4	21·0	1·105
,, 25	Celliers	Groen Berg, do. ..	3·8	20·8	1·104
,, 25	C. G. Furter	do. do. ..	4·2	21·0	1·105
,, 25	P. Kreigler	Boven Vley, do. ..	3·2	21·2	1·106
,, 25	J. J. Malan	do. do. ..	6·2	19·2	1·095
,, 25	G. M. J. Retief ..	Wellington	4·5	21·0	1·105
,, 25	J. D. Retief	do.	4·02	18·8	1·093
,, 26	H. Pepler	French Hoek	..	19·2	1·095
,, 26	J. J. le Roux ..	do	..	19·2	1·095
,, 27	J. Roux	Moddergat, Stellenbosch ..	..	21·2	1·106
Mar. 4	J. M. de Villiers ..	Paarl	..	19·7	1·098
,, 5	J. M. Beyers	Stellenbosch	..	14·4	1·070
,, 5	F. Michau	do.	..	17·7	1·087

Date. 1884.	Name of Farmer.	Locality.	Acid. per mille.	Sugar per cent.	Specific weight.
Mar. 5	A. Roux	Eerste River	..	20·7	1·103
,, 6	A. Cloete	Jonker's Hoek, Stellenbosch	..	21·2	1·106
,, 6	J. Roux	do. do.	3·9	21·6	1·108
,, 6	A. Watermeyer ..	do. do.	4·4	20·7	1·103
,, 6	A. Watermeyer ..	do. do.	..	21·2	1·106
,, 8	R. v. d. Merwe ..	Hex River	..	18·2	1·090
,, 8	P. de Vos	do.	5·6	18·8	1·093
,, 12	D. Hugo	Riebeek's Casteel	4·5	21·6	1·108
,, 12	D. Roux	do.	4·1	23·4	1·118
,, 13	D. Malan	do.	3·7	25·5	1·130
,, 13	N. Mostert	do.	3·3	24·7	1·125
,, 15	J. Meiring	Hex River East	..	18·2	1·090
,, 15	W. Meiring, sen. ..	do.	..	19·2	1·095
,, 15	W. Meiring, jun. ..	do.	5·8	19·2	1·095
,, 15	M. de Vos	do.	5·2	21·0	1·105
.. 26	S. v. Reenen	Constantia	5·5	20·8	1·104

Average Acidity, 4·4.

The making of the wine is on the whole very primitive, in no way corresponding with the excellence of the grape. In order to raise the wine-industry in the Colony, and to introduce better methods of wine-making, the Colonial Government decided two years ago to appoint a colonial viticultural expert, and it may now be said that no better man could be appointed to this very important position than Baron C. v. Babo, the son of Baron F. von Babo of Klosterneuburg. Since his arrival in the Colony, the Colonial Government has purchased the famous estate of "Great Constantia," where under the superintendence of Baron von Babo and two other European viticulturists, the best methods of growing and making wine are carried out, where at the same time a number of young wine-farmers receive instruction in all the different branches of viticulture. The last report of Baron von Babo, to the Colonial Parliament contains the following obsevations:—

The different kinds of Grapes in the Colony.—The most common grape is the *Green grape*. This is, however, not due to the superiority of this grape over the others, bnt principally to the fact that this grape withstands the action of insects and of fungus better than others, and that it has a more vigorous growth. It will certainly produce a good wine for export.

The *Haanepot* is distinguished by a strong bouquet which might make the hanepot wine very superior; the wine is, however, very delicate with regard to soil, oïdium, and rust. Until a better manipulation of wine has been generally adopted, it will be advisable to use the hanepot only for making raisins. The present way of making raisins is unsatisfactory, the dipping into ash-lye before drying imparts a harsh by-taste to the raisins, which renders them unfit for the European market. Large quantities of raisins are then made into wine, and good raisins will find a ready market. The hanepot can also be used

with advantage for export, as it is more fleshy than other grapes. At present this grape is sent as far as Kimberley and the Transvaal during the hot summer months, and stands a journey of ten days; therefore if properly packed, and if kept in a cool place, it must stand the long voyage to Europe.

The Stein Grape.—This grape is not common, but is distinguished under favourable conditions by a large yield. The Stein wine is a most delicate wine.

Red Muscadel.—This grape ripens early and produces good wine. The wine when old is a superior invalid wine.

White Muscadel.—The white muscadel possesses a strong muscat taste. It is not much grown, but will most likely be suitable for making sweet wines.

Of the dark grapes the *Pontac* is the most valuable. With careful manipulation it will give a very fine dark wine, which equals the Bordeaux, and which will always find a market in Europe. It is comparatively too little grown, and if properly manipulated will not cover the demand in the Colony. Besides the above-mentioned varieties there are some others grown in the Colony, but it is at present impossible to say anything definite as to the quality of the wine which would be made from these grapes. In many vineyards two or more kinds of grapes are planted all mixed up, and on the whole sufficient attention is not paid to planting the vineyards uniformly with one kind of grape. As the different kinds of grapes ripen at different times a great deal of inconvenience is experienced at the time of harvest, because the men have to go through the vineyard twice. If the grapes of different varieties are all plucked at the same time and thrown together, an inferior wine is produced.

The making of the Wine.—In the sun of South Africa the grapes ripen to perfection, and the South African grapes are an excellent material of which to make wine which will find ready customers. But in consequence of great negligence and bad or insufficient manipulation, a wine is produced which does not deserve the name of "wine." This is borne out by the ill success of the numerous attempts made with a view to exporting Cape wine to Europe in large quantities. The fact that small samples of better wine arrived in a sound condition in Europe does not disprove the fact that the bulk of the Cape wine would not stand the journey to Europe. I have frequently heard the opinion expressed, that no wine made at the Cape could stand the voyage to Europe. This is entirely erroneous and false; all wine merchants in Europe know perfectly well in what condition a wine must be in order to stand a sea voyage, during which it is exposed to very high and very low temperatures. If common Cape wine (*i.e.*, wine with fusel or spirits taste) is taken to Europe, it is obvious that such an article cannot find friends amongst a public which is accustomed to the exquisite wines of Europe. They do not like the Cape taste, but I still doubt whether the taste of the public at the Cape is such, as to object to wines which have been properly prepared. I hold that properly manipulated Cape wines will find a market in the Cape Colony as well as in other parts of South Africa.

Character of the wines of the merchants.—These wines, with a very few exceptions, have in common a disagreeable and strong brandy taste. Such wines have been mixed with so much brandy that they cease to be wines; they are liqueurs. Notwithstanding the large amount of alcohol which they contain, they are not clear and always somewhat "dusty." In consequence of the addition of other substances they acquire a by taste which does not improve them. And they are not free from diseases; many are distinguished by a pronounced acetous taste. The colour is often made darker by means of burnt sugar, to let it appear older; but the immature character of the wine is not done away with by these experiments. No attention is paid at all to the difference between table wines and sweet wines. A considerable fraction of the wine-drinking community wants sweet tasting wine, and this compels the merchant to make dry wines sweet, and this is generally done by sugar, or by the addition of extract wines. It is obvious that wines of this nature cannot find favour with all wine-drinkers, and the consumers are compelled to turn to beer or brandy, which are imported in large quantities. And how readily could good wine compete with these articles! These wines, of course, cannot ever be expected to be fit for export. Also some very old wines are met with here and there; and they are very good, but in quantity too insignificant for purposes of export. It was the old wines which in former times established the reputation of the Cape wines. Something very superior was then meant by the words "Cape wine," and it is to be hoped that this old reputation will be re-established, to the benefit of the active, ambitious, and unprejudiced wine farmer and wine merchants at the Cape.

As I have stated already, it is the *manipulation of the wine* which is to be blamed for the quality of the Cape wine. The cutting of the grapes, the separating of the ripe from the unripe grapes, the collecting of the grapes before pressing, is all done, with a few exceptions, in a careless manner. But the climax of the untidy proceedings is reached in the tramping of the grapes. During this operation the germs of the acetous fermentation are carried on the feet from the floor into the fermenting liquid. There is in almost all cellars wine spilt on the floor, in which the acetous germs develop and exist; they fill the air of the stores and get also in this way into the wine. In those districts where the grapes ripen late, the chances for the development of acetous germs are less favourable, and more sound wine is found there than where the pressing is in the hottest time of Feburary. The liquid obtained by means of tramping from the grapes is brought into the fermenting vats. The mistakes made in this operation are the following:—The fermenting tubs are open; the air has free access, and with the air the enormous quantity of acetous germs which are in the wine store, and they can freely and beautifully increase and develope. The free access of warm, almost hot, air also allows a luxuriant development of the germs of the alcoholic fermentation; the fermentation is therefore much too powerful, the fermenting wine gets too hot, so that the germs of the alcoholic fermentation are interfered with in their action on the sugar, and a portion of the sugar remains unfer-

mented, and thus the fermentation is unfinished and the wine sweet, and is difficult to manipulate, on account of the still unfermented portion of the sugar, which may any time commence to ferment again. The rapid fermentation in open vats also affects the taste and the bouquet compounds. By fermenting the must on the husks the raw tannin-containing compounds are extracted from the husks; husks and stalks should therefore be separated from the must of the light wines. The juice of the dark wines must ferment on the husks. The fermentation of the juice of the dark grapes should only be carried on in closed tubs. The fermentation of the juice of the white grapes must be done in casks provided with fermentation bungs.

The more or less fermented must is transported into casks. The casks, as well as the stores in which they are, are often deficient; most stores are not well kept. A wine store in this hot climate, which is not kept scrupulously clean, cannot produce a sound wine. Cleanliness, and only cleanliness, is the first condition in the manipulation of wine. The wine store should not serve as a receptacle of all sorts of things; it should be a wine store only.

The old wine stores, which may still be found on many farms, were better constructed. They were in the shade of trees, covered with thick thatch, with solid substantial walls. and cool in summer. In these stores was made, with the application of more care, a better wine, and even now these stores distinguish themselves by the better quality of wine which they contain. The wine could at least properly mature in such stores, and could gain the reputation which formerly the Cape wines had. The modern stores are light structures. They must be as cheap as possible; the roof is made of iron, the walls are thin, and the whole flimsy framework is exposed to the rays of a burning sun. The temperature is in summer excessively high, and in winter very low. The wine now, insufficiently prepared and kept in such stores, cannot be good.

But in order to keep the wine all sorts of means are employed. One of these is to sulphur the wine. The sulphuring prevents, of course, the complete turning of the wine, but keeps it sweet, and thus prevents any maturing or getting to perfection of the wine. Another means for keeping the wine is brandy. It is added in such exorbitant quantities as to prevent any further development of fermentation; the character of the wine is, of course, by this completely altered. If sound wine is kept in clean casks in a good store, there is no need for brandy. The addition of alcohol can only be recommended for making sweet wine. Many wine farmers want to fine the wine the first year. Blood and lime are used for this purpose, but the use of both must be strongly condemned. The whole secret of making wine is to press the juice in the cleanest possible way; to ferment the juice in closed casks, or in peculiarly constructed fermenting vats (for red wine); to keep it in clean casks in a clean store; and to draw it over *four* times during the first year; after this it is ready to undergo the more refined manipulation.

On the making of brandy and raisins and on the export of grapes Baron van Babo reports as follows :—

The making of brandy is of greater importance in those districts where little wine is made. It is made here in the following way: the grape juice with all the husks is left in the tubs until the first fermentation is over; husks and must are carried into the still and submitted to distillation. As the grape juice has only passed through the first fermentation a very considerable amount of sugar remains unfermented and is completely lost. The farmers are compelled, however, to proceed in this way, because there is such a complete want of the necessary amount of fustage, tubs, &c. As they can only proceed with cutting grapes after the tubs are empty, it is evident that a very large amount of the yield of the vineyards is wasted. It is certainly not the way to derive the greatest possible benefit from the vineyard. Wine which is intended for making good brandy should pass through the following stages:—The grapes are cut, cleanly pressed, and the must fermented in closed vessels. After the first fermentation the wine is frequently racked, and all particles of yeast which remain for a long time in suspension should be removed by filtration. By this treatment the bouquet of the wine is developed to perfection and the wine is ready for distillation; the bouquet of the wine passes into the brandy and renders it valuable, exportable and marketable everywhere in Europe.

Raisins are also made at the Cape, and there used as such; that is to say, they are not used for wine making. There are two kinds of grapes used for making raisins, the Haanepot and the Currant grape, which yield very different products. The Haanepot raisins are large and thick-skinned, the latter small thin-skinned currants; but the value of the latter is three times that of the Haanepot raisins. As the Currant grape bears more and can be more easily dried, its cultivation is much to be recommended; it would be a good export article. The Haanepot is dried in the same way as has been described in the preparation of sweet wines. But the unsatisfactory way of preparing the raisins shows itself here, more than in the preparation of sweet wines. I should recommend only artificial drying, using the large drying apparatus, which is employed in the southern European countries for drying fruit. By means of this apparatus it is easy to get light coloured raisins, and they are specially valuable for making sweet wines. The French wine manufacturers only use fresh raisins, and only those which have the least raisin taste.

Some varieties of grapes are certainly an excellent material of which to make raisins; if they are made in good quality they will have a reliable market in Europe. But if good wine be made, it will pay better than raisins.

Fresh grapes, which have to stand a long journey before they reach their destination, must possess certain qualities. They must belong to that class of grapes which is called "grapes for eating." They must be fleshy, hard, and the skin tough, and they must not be readily putrifiable. All these properties are to be found in the White Haanepot grape. The second point of importance in the export of grapes is the packing. In an experiment which has been made this year, in sending fresh grapes to England, which arrived there in perfect con-

dition, the packing was the following: properly selected bunches were carefully examined, to remove all berries which were not perfect or were damaged, and also those which made the bunch too compact. The point of the stalk, which was cut, was sealed with wax. This prevents the drying and shrinking of the grapes. The bunches were then wrapped in soft paper (tracing paper) to prevent their being soiled by the packing materials. In the one box charcoal was used for packing and in the other cork dust. The bunches were put in layers in the boxes and these separated by layers of cork dust or charcoal. The place in which they are kept on the voyage should not be too hot nor too cold. The most suitable temperature is 35° to 45° F. As the Cape grapes could reach the European market just at the time when the price of grapes is highest, all expenses would be paid and a handsome profit left.

It will be of very great importance to the European wine merchant to know that in the Cape Colony spirit is only made from grapes, and that of late the most excellent wine-spirit, containing all the aromatic bouquet compounds of the wine, has been prepared in the Colony. Samples of it are now being exhibited in London. This wine-spirit is most suitable for improving the inferior European wines, and for the manufacture of sparkling wines. Much has been done by some merchants of Cape Town and others interested in the development of the resources of the country, to induce the wine-farmers to bestow more care upon the preparation of raisins, than has been the case before.

With regard to the export of grapes to Europe, it is not likely that the Colonial wine-farmer will ever carry this out on a large scale, and much chance of success is here left for European enterprise.

The Phylloxera has now made its appearance at the Cape, but only a few vineyards have so far been affected. The insect was discovered at the beginning of this year (1886) in some vineyards near Cape Town. It is to be hoped that the Government will, by the means which are adopted, succeed in retarding the progress of the phylloxera, so that the wine-farmers of the Colony will have time to replant their vineyards with grafted cuttings of American vines, which are not attacked by the insect. If this be done the Colony need not fear the plague, and the wine-industry at the Cape will remain what it is now, a source of revenue to the greater part of the population of the Western Province.

MANUFACTORIES, MINES, MINERALS, &c.

The greater part of our Colonial products consists of raw materials which are sent to the English markets for manufacture; but there are many of them which, in their preparation or in their conversion into articles of domestic use and consumption, give employment to a considerable amount of capital and labour.

The manipulation of wines, the manufacture of spirits, and the brewing of beer, are industries which have taken firm root amongst us, and are now of considerable proportions. In Cape Town and its suburbs there are seven large breweries; and recently the cultivation of hops has been commenced, and promises to be carried on with success. There are also many extensive steam milling establishments for converting wheat into flour of several descriptions, and for the manufacture of biscuits of first-class quality.

Articles of furniture from the indigenous woods of the country have been for many years in general use, and recently the production of some exquisite suites of drawing-room and bed-room requisites from the yellowwood and Cape laurel (stinkwood) has brought this industry into considerable favour. Carriage and wagon-making give continual occupation to many workmen, there being an extensive trade carried on with the inland districts in the supply of transport and travelling wagons, light hooded spring carts, and carriages. There are also iron foundries and engineering establishment, capable of executing any mechanical requirements.

The manufacture of woollen fabrics has not become an established industry; but a beginning is now being made at the Waverley Woolwashing Company's Works, near to Ceres Road railway station. There is a boundless supply of water power there, at present utilised by a Lefell double turbine, for working the woolwashery, which is capable of turning out 120 bales in a day; this will be applied to power-loom machinery, for the manufacture of woollen blankets from the colonial staple for the colonial market; and there is every reason to believe that the industry will be most successful.

Leather manufacture has been in operation for some years, and there are several large tanneries, both in Cape Town, Port Elizabeth, and Graham's Town. Ox and horse hides, calf, goat, and sheep skins are plentiful, and the very best materials for preparing them are to be had in any quantity. Many indigenous plants and trees, such as kreuppelboom, wagenboom, kliphout, wild plum (shumac), assegai, saffron, and mimosa, as well as the European oak, are in common use for tanning purposes. Fellmongering has

been commenced, and many skins, formerly little valued, are bought up, and by this process have the wool upon them turned to account, as well as the pelt preserved. Soap-making has also been established, and the colonial article is to a great extent supplanting the imported one.

Boot and shoe manufacturing, saddle and harness making, brick making, iron and tinware work, tobacco, cigar and snuff making, and ærated water manufactories are also widely distributed over the Colony.

Confectionery and jam making have received a stimulus during the last year or two, from the provision made by the Legislature for granting a rebate of duty on sugar used wholesale for the manufacture of jams, preserves, and confectionery. The preserves of the Cape—gooseberry, naartje, orange, lime, guava, quince, melon, citron, peach, fig, apricot, and other varieties—surpass any of the English manufactured fruits. Many of these are now being made for wholesale exportation.

Mineral springs are numerous throughout the Colony. They are chiefly sulphur, chalybeate, and thermal; and are distributed over some thirty or forty different districts. At the town of Caledon there are four thermal chalybeate springs, containing carbinate of soda 2·10 grains; sulphate of soda ·862 grains, and common salt 4·027 grains per gallon, the total of soluble ingredients being 12·225 per gallon; temperature 120° F. At Malmesbury, there is a sulphur spring, temperature 88°. At Brandvlei and Goudini (Worcester division) there are thermal springs, the first-named with a temperature of 145°. Near to Graaff-Reinet, at Kruidfontein, there is a cold sulphur spring. Near Uitenhage, there are two mineral springs, at "Balmoral," the farm of General Nixon, and at Sandfontein. Midway between Willowmore and Uniondale, there is a thermal chalybeate spring, temperature 112°. Near to Robertson and Montagu, and at Prince Albert, there are other springs of considerable repute. All of the mineral springs are considered to possess more or less of curative powers in chronic cases of rheumatic and cutaneous diseases. Samples of the mineral waters of the Caledon springs have been forwarded to the Colonial and Indian Exhibition.

The medicinal plants of the Colony are many and varied, about 100 of them, commonly used as remedies by the colonists and natives, have been enumerated by the late Dr. Pappe,* who, however, stated that there were others of unquestionable worth which he had not enumerated because they were not actually employed by the inhabitants. From the richness and extent of the South African Flora, no doubt many useful efficient drugs will still be

* Floræ Capensis Medicæ Prodromus: By L. Pappe, M.D., Cape Town, 1857.

discovered, and form a valuable addition to the Pharmacopœia. A contribution to the South African Materia Medica, chiefly from plants in use among Kafir natives, has also been made by Dr. A. Smith, M.A., of the Lovedale Institution, and among them are some used as antidotes for snake-bite, one being a tincture or infusion of the Wild Dagga or Wild Hemp (*Leonotis Leonurus*).

Fishing is carried on in all the bays which indent the coast. At some places there are large private establishments for the curing and export of the bountiful treasures of the deep, which give employment to numbers of the coloured people. 335 boats and 1,800 persons, are engaged in connection with the sea fisheries, and the quantity and value of salted or cured fish exported in 1884 was respectively 2,741,966 lbs. weight, and £16,206 value.

On the small islands along the west coast of the Colony, and forming part of it, there are valuable deposits of guano, which finds a ready market both in the Colony and in England. Prior to the year 1877 all these Guano Islands were leased out of hand under the superintendence of the Officer in charge of H.M.'s Customs. Since then the leases, as they lapsed, have been disposed of by public tender by the Surveyor-General, subject to the approval of Government, and under this arrangement all the following existing leases have been entered into, with the exception of No. 1, Ichaboe, the lease of which does not expire until 29th June, 1895 :—

RETURN OF LEASES OF GUANO ISLANDS.

Description of Rock or Island.	Present Lessee.	Term of Lease, Years.	Lease Expires on the	Annual Rent.
				£ s. d.
Ichaboe, West Coast	De Pass, Spence & Co.	26	30th June, 1895	800 0 0
Yzerklip Rock, Malmesbury ...	J. C. Kotze	15	31st July, 1889	2 0 0
Elephant's Rock & Bird Islands, Oliphants River, Clanwilliam	J. Roe	5	31st Aug., 1887	105 10 0
Islet, Lamberts Bay, Clanwilliam	Stephan Brothers ...	5	31st Oct., 1889	553 0 0
North West Rock, St. Helena Bay	J. Roe	5	31st Aug., 1887	32 0 0
Paternoster Island, Malmesbury Marcus Island, Saldanha Bay... Jutten Island, do.	M. Almeyda	5	31st Dec., 1885	1,561 0 0
Jacobs Rock & Robbenstein, near Saldanha Bay	J. Roe	5	5th Feb., 1888	135 0 0
Malagas Island, Malmesbury ...	J. Spence	5	31st Dec., 1886	1,500 0 0
Schaapen Meeuwen Eiland, Saldanha Bay	J. W. Stigling ...	5	30th Sep., 1885	12 10 0
Foundling Island or Rock near Saldanha Bay	W. Humphris ...	5	30th Nov., 1889	315 0 0
Dassen Island, Malmesbury Coast	Stephan Bros. ...	5	31st Oct., 1889	1,523 0 0
Vogelstein Blaauwberg Beach...	J. Roe	5	31st Aug., 1887	22 0 0
Duiker Klip, Hout Bay... ...	J. Roe	5	31st Aug., 1887	29 0 0
Seal Island, False Bay	W. Humphris ...	5	30th Nov., 1889	215 0 0
Dyker's Island & Contiguous Islands, Caledon Coast	H. Wilman	5	30th June, 1887	230 0 0
St. Croix Island, Algoa Bay ...	W. & R. Messina ...	5	31st Aug., 1888	75 0 0
				7,110 0 0

There are extensive and valuable salt pans throughout the Colony. One of them, situated nine miles from Uitenhage, has been valued for rateable purposes at £18,000. The salt produced there is of an excellent quality; and the quantity appears inexhaustible, for, although 40,000 muids per annum are taken out, there is no apparent diminution of yield. The "pan" is a depression about forty feet below the adjacent country; and in the bottom are alternate crusts of salt from one to ten inches in thickness and black mud. Several layers of salt are known, but no shaft has been sunk to test the thickness of the deposit. Here, as in other pans, the salt is dissolved by rain, and when re-deposited on evaporation is scraped off with spades. In the district of Middelburg, between the village of Maraisburg and the Fish River, there are three salt pans each with an area of 400 or 500 acres. At one of these the salt is raised and evaporated in artificial pans, thereby securing an increased and constant supply of a quality equal to any imported.

The following return shows the number of the principal Pans in the several divisions of the Colony; the average annual yield of Salt, and the average value per muid (three bushels) :—

Division.	No. of Pans.	Total Annual yields, Average (in Muids)	Value, Average (per Muid).
Caledon..	1	rarely worked	8s. to 9s.
Calvinia	3	Do.	8s. to 10s.
Clanwilliam	3	900	3s. to 6s.
Cradock..	3	5,500	3s. to 9s.
Hay	2	1,000	15s.
Herbert..	3	1,200	5s. to 10s.
Hope Town	1	200	12s.
Malmesbury	7	23,000	1s. 6d. to 2s.
Middelburg	1	200	12s.
Namaqualand	2	4,600	9s.
Piquetberg	7	7,150	2s.
Port Elizabeth	2	12,800	1s. 6d. to 1s. 9d.
Riversdale	3	300	6s. to 16s.
Simon's Town	1	4,500	4s. to 8s.
Swellendam	1	350	7s. 6d. to 10s.
Tulbagh	4	200	7s. 6d.
Uitenhage	1	35,000	5s. to 7s 6d.
Victoria West	3	not given	20s. to 25s.

Of the mineral resources of the Colony, after the Diamond Mines of Griqualand West, already fully described, the most important

product is copper, which is found throughout the district of Namaqualand. The existence of copper in that locality was known nearly two centuries ago, and as early as 1685 attempts to turn it to account were made by the Dutch Company's Governor, Simon van der Stell, and afterwards by others, but without success. The want of fuel and the difficulties of transport in those days were probably insurmountable obstacles to enterprise. It was only thirty-four years ago that the working of the mines was commenced by a Cape Town firm, the late Messrs. Phillips & King, now King and Son. They opened the ground at Springbok, which then was a desolate place, with merely a mud cabin and a few mat huts occupied by the natives. The first eleven tons of ore were shipped by the steamer *Bosphorus* on the 31st August, 1852. Since then the exports have year by year largely increased, until now the annual production is about 20,213 tons of ore.

The principal mining station is Ookiep, situate five miles north of Springbok, and ninety miles from Port Nolloth, with which it is connected by a railway. This is the most important of the Cape Copper Mining Company's centres. There is a population of about 1,800 persons on the place, a portion of whom work underground and the remainder on the surface, in the different occupations connected with the mine. A number of these are Cornish men and skilled European artisans; but there are also labourers from St. Helena, and Hottentots, Bastards, Damaras, and other natives employed.

The Cape Copper Mining Company, although the largest and most important, is not the only association engaged in mining. The Namaqua Mining Company are busily and economically working the Concordia Mines, including Hester Maria, Wheal Julia, and Tweefontein. There are many other mines in the district, which are leased from the Government; but the mines worked by these two Companies are the only ones from which ores are at present extracted.

Another mineral product to which special attention is now being directed, as the needful base of many industries for which there are openings in the Colony, is that of coal. In the Stormberg Range, extending over the districts of Albert, Aliwal, and Wodehouse, Xalanga and Maclear, deposits of vast extent occur. At one or two places, known as Molteno and Indwe, the coal seams have been worked for some years past, chiefly for local consumption within a radius of eighty miles from the pits mouth; beyond that distance the cost of carriage being prohibitive. Since the railways have been carried to the neighbourhood of the mines, however, the economic importance of this coal is being developed, and it has already displaced the English imported article on the Eastern system of communications. One encouraging

feature of the coal seams of the Stormberg is the ease with which they can be worked. There is no sinking of shafts required, with elaborate machinery for lifting the coal, pumping out water and supplying of air. A simple heading is made at the outcrop of the seam, which is seen under the sandstone strata, and the tunnelling proceeds forthwith into the hill-side. At Cyphergat a siding extends from the railway towards the mine, and the coal is brought from the workings on wagons on a small tramway and tipped into the railway trucks. There are three seams of coal in the working at present open, which are 6, 4, and 16 inches thick respectively, making in all 26 inches of coal and 28 inches of shale; the height of the working being 4 ft. 6 in. The work is done with picks, no gunpowder being used; and the miners are both white men and Kafirs.

At Indwe a seam of coal, four feet six inches in thickness, and of a better quality, has been opened, and 500 tons can be put out per mensem. At present the quantities of coal supplied under contract with the Government from the different mines is as follows:—Vice's Mine, three hundred tons per month, at 16s. per ton; Fair View Mine, three hundred tons per month, at 17s. per ton, or if five hundred tons are delivered, then 16s. per ton; Cyphergat, five hundred tons per month, at 16s. per month; Indwe, two hundred tons per month, at 25s.

Trial borings in the Karroo beds are about to be made, with a view to the settlement of the question as to any deposits of coal being found there that would be servicable to the central and western districts of the Colony. If the result prove unfavourable, the development of the Stormberg mines, and their connection with the whole railway system of the Colony, will be a settled matter.

Manganese ore occurs on the ranges of the Cape Peninsula and Drakenstein mountains. Near Du Toit's Kloof, about 30 miles from Cape Town, a mine has been opened and worked by a private company; the ore is plentiful and rich, yielding from 70 to 90 per cent.

The ornamental stones of the country are very beautiful, and of considerable variety. Foremost among the gems is the diamond. These are found of every tint, from the perfectly limpid stones, possessing great fire, found at Jagersfontein and the River diggings, through many shades of yellow, &c., to dark yellowish-brown stones. In size they range from a large walnut down to the minutest specks. All are beautifully crystallized.

Garnets, both red and green, are found in the north-western portion of the colony: they are abundant at the diamond mines as coarse fragments; but at the River diggings there are rounded forms of very beautiful appearance, some rivalling the ruby in colour.

The Agates are specially beautiful, and are of many colours and shades. In the Vaal River they are so ground down and polished as scarcely to require any further polishing. In the Orange River also they are numerous and handsome.

Crocidolite, an asbestiform mineral of interest, occurs in Griqualand West. This is commonly confounded with asbestos, which is, however, quite a distinct species. The crocidolite usually occurs between the bedding plains of jasper, in layers of one to three inches in thickness, and of dark bluish colour. This fibrous mineral might be found useful for some economic purposes.

The pseudo-Crocidolite is a remarkably handsome ornamental stone, found in Griqualand West, and also south of the Orange River. It is a species of fibrous quartz that displays a distinct ray of light down the centre when properly cut. Vast quantities of it are now being worked up into jewellery, as lockets and ornaments of all sorts. It is especially susceptible of artistic effect on account of the great variety of shades and colours in which it is found.

The quartz minerals are well represented. There are cairngorms, quartz crystal, amethyst, rose quartz, &c. Red and yellow jaspers, and striped and clouded jaspers. Chalcedony is very abundant along the courses of the Orange and Vaal Rivers. Bloodstone is also found in the Orange River. Prehnite, a mineral of beautiful sea-green colour and very handsome as an ornamental stone, is found in many parts of the colony.

Iron ores of many varieties, and some very rich in iron, are very abundant in many parts of the country. Lead ore has been found at the Orange River, and elsewhere; and zincblende occurs in various localities.

Sandstones and freestones, suitable for building, are widely distributed. Marble of very beautiful colour and handsomely mottled is found in many localities. The Paarl granite is especially fine and durable. Sandstones and grits, suitable for mill-stones, grindstones, scythe-stones, &c., are abundant, especially in the mountainous districts, such as the Stormberg. Clays of great value and adapted for the production of every description of pottery, from the finest porcelain to brick and tiles, are abundant, but have, as yet, received but little attention.

Numerous other substances of economic value may be discovered, if a systematic examination of the country is made—for it is true of the Cape Colony, as of Africa generally, that it is always rewarding search with something new.

SKETCH OF THE FLORA OF SOUTH AFRICA.

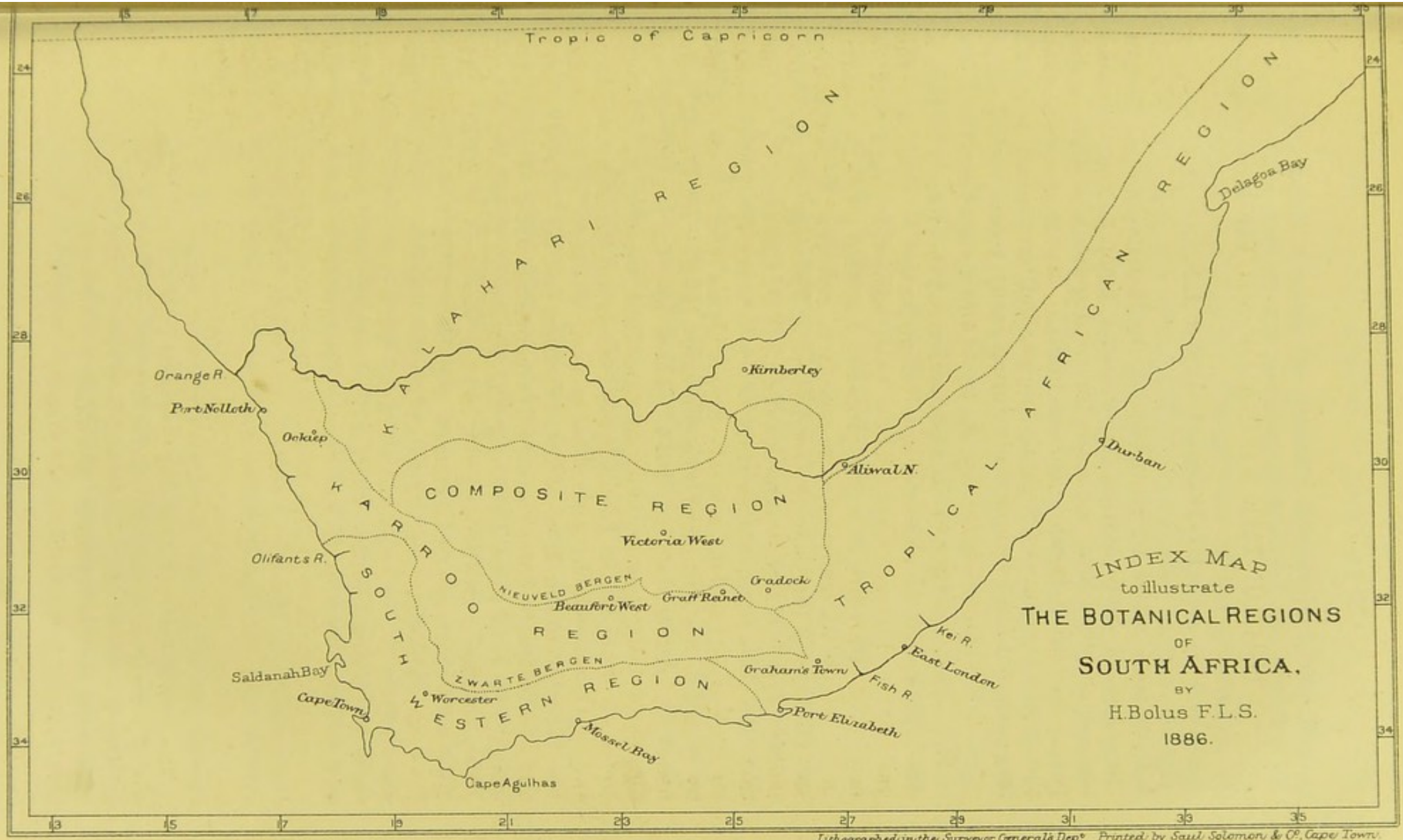
By Harry Bolus, F.L.S.

I have been asked to contribute to this Handbook an account of the Flora of South Africa. I willingly comply; but I desire it to be understood that, since the time and space placed at my disposal are restricted within narrow limits, I cannot give more than the merest outlines of a great subject, and but a small part of a large mass of observations made during many years.

RICHNESS OF THE SOUTH AFRICAN FLORA.

Ever since the time of its first settlement the Cape has been a constant source of pleasure and delight to the botanist and the gardener. Though Cape plants have somewhat gone out of fashion of late years, it is still probably true that no single country in the world has contributed so largely to European conservatories and gardens as the Cape of Good Hope. The despatch of plants, indeed, began before the settlement by Van Riebeek, for we find that one Heurnius, a missionary *en route* to the East, had sent to his brother at Leyden, several curious plants which were figured by Stapel in his edition of Theophrastus' History of Plants, published at Amsterdam in 1644. These are the earliest known figures of Cape plants, and amongst them was the well known *Orbea variegata* of the Lion's Rump, which was called a Fritillary, and an Oxalis which, with equal reason, was styled a Trifolium! But those were the days before Linnaeus had arisen with master mind to reduce to order the rapidly increasing stores of vegetable forms. In 1772 came Thunberg, the Father of Cape Botany; in 1810, Burchell; in 1825—1834, Ecklon, Zeyher and Drège. All these made journeys of thousands of miles, and of several years in duration, exploring the vegetation of the country. Besides them were others of less note, and a host of gardeners and collectors of seeds and living plants. From 1775 to 1835, Cape plants may be said to have been quite the rage. The conservatories, temperate houses, and gardens of England and the continent teemed with the Pelargoniums, Heaths, Proteas and other handsome flowering shrubs, and the lovely bulbous plants of Irideae, Amaryllideae and Liliaceæ; and the pages of the Botanical Magazine and other similar periodicals were filled with figures and descriptions of them.

The public taste of that day was amply justified. Perhaps the recently increasing exportation of flowering bulbs may be taken as an indication that the fashion will be revived. But though fashion in flowers may be variable, the interest of science is more permanent; and notwithstanding the diligent exploration of the country



Lithographed in the Surveyor General's Dep.t Printed by Saul Solomon & Co., Cape Town.

for the last hundred years, the constant discovery of new forms, even up to the present day, has largely occupied the attention of systematic botanists.

Without the means, in the present state of our knowledge, of precisely comparing the relative number of species of flowering plants in this, and any other portion of the earth's surface, enough is known to enable us to say that South Africa ranks amongst the richest of regions. But if we ascend to those higher systematic groups called Genera and Orders, we can speak with a greater approach to accuracy. These may be compared in two ways. First, for the sake of the general reader, the numbers of these in South Africa (and by the term South Africa let it be understood that I mean always Africa South of the Tropic of Capricorn) may be compared with the known total for the whole world. The latter is taken from Bentham and Hooker's *Genera Plantarum* (Journal of Botany xxi, 156) :—

Whole World	Orders 200 :	Genera 7569
South Africa	„ 142 :	„ 1255

Secondly, we may compare South Africa with another country, in the same hemisphere, for the most part in the same temperate zone, and of which the Flora is about as well known as that of South Africa, *e.g.*, Australia.

I take the figures for the latter from Sir J. D. Hooker's well-known Essay: *On the Flora of Australia* (*London*, 1859). And we have the following result :—

Australia	Orders 152 :	Genera 1300
South Africa	„ 142 :	„ 1255

The area, however, of Australia is five times larger than that of extra-tropical South Africa ; and what is of more importance is the fact that its eastern coast line runs up into the tropics to nearly the 10th degree of S. latitude. It will be evident, therefore, how much richer in variety of forms, relatively to area, is the Southern extremity of the African continent, than that of Australia.

There is another interesting point in the number of endemic genera in each area, that is, of genera exclusively restricted to each country. In Australia these are about 520 (Hooker) ; in South Africa 446.

Why South Africa should be so rich in vegetable forms, is a question which cannot yet be fully answered. Proximate causes appear to be

(1) The meeting and partial union of two (perhaps three) distinct Floras of widely different age and origin.
(2) A highly diversified surface of the land and of soil.
(3) A climate with much sunlight (or little cloud) ; a condition which seems everywhere favourable to the multiplication of forms.

No one could form an adequate or accurate conception of the Flora of South Africa who should regard it as a single Region. Meyer and Drège (*Comment. de Plant. Afr. Austr. Lipsiae*, 1835) divided the Colony south of the Orange River and Natal, into five Regions, and numerous districts and sub-districts. The value of Drège's observations cannot be over-estimated, and form the necessary basis of all later investigations; but the divisions were too numerous, and broad distinctions were over-loaded with a mass of subordinate detail. Grisebach (*Vegetation der Erde, Leipzig* 1872) regarded the Colony proper as far eastward as the Kei River, as forming one Region: the "Cape"; Eastward of this he brought down the continuation of his vast "Soudan Region," and north of the Orange River, he constituted his "Kalahari Region" out of Great Namaqualand, Damaraland, Bechuanaland, &c. As far as they go, and except for the error in supposing the Orange River to be a floral boundary, these Regions appear to me to be natural. But Grisebach's "Cape Region" cannot possibly be regarded as one; it must be divided into two at least; and perhaps with more propriety into three. The Flora of the Karroo of the Cape may probably prove to be more distinct from that of the South-western portion of the Colony, than is the latter from that of Australia.

I propose, therefore, to regard South Africa as including five natural Regions, two of which extend beyond its limits, while the others are included within them. These are:—

(1) The South Western Region
(2) The Tropical African ,, (Grisebach's "Soudan")
(3) The Karroo ,,
(4) The Composite ,,
(5) The Kalahari ,, (Grisebach)

The South Western Region.

It is the South Western Region which has for the most part furnished that large quantity of garden plants which I have referred to above, and which is the home of what has been for the last hundred years popularly known as the Cape Flora. It is an angular littoral strip, bounded on the west coast by the Olifant's River and the mountains near it, but including properly the mountain range from Cedarbergen up to the Khamiesbergen; on the east by the Van Staden's mountains; and inland by considerable mountain chains under various names. Its greatest width does not exceed eighty miles, and probably averages not more than fifty miles. The inland mountain chains referred to may average 4,000 feet in height, attaining sometimes (Great Winterhoek) 6,800 feet. The surface of the Region is extremely diversified; sandy and bushy tracts alternating on the coast with grassy downs, and vast mountain slopes of the most barren

appearance when lying a short distance inland, but clothed with an immense variety of small plants.

The soils are varied, the exposed rocks being chiefly granite, clayslate (Malmesbury beds: Silurian?) and sandstone (Table Mountain Sandstone: Devonian); with insignificant exceptions, tertiary deposits are absent, occurring only in low places and of shallow depths. Throughout South Africa the influence of soils upon the distribution of plants appears to be less important than that of climate and exposure.

Rivers are few, and badly supplied with water except in winter; practically, none of them are navigable.

The mean annual temperature of Cape Town is 16°25 C. (61°25 Fahr.); of the six summer months 20° C., and on the six winter months 12°5 C.; the mean annual humidity of the atmosphere 71·83 per cent.; the mean annual rainfall in the city itself is 23·80 inches; but in the suburbs it reaches in some localities to 60 inches. Further inland the temperature is higher, the extremes greater, and the humidity and rainfall much less. At Worcester, situate about 60 miles from Cape Town, the mean annual temperature rises to 16·93 C.; the humidity is 54·40 per cent.; and the average rainfall is 12·47 inches. About two-thirds of the whole rainfall takes place during May, June, July and August; and the months of January to April are usually very dry. The whole rainfall of this Region attains its maximum near Cape Town; and diminishes rapidly as we proceed northward up the west coast.

The prevailing aspect of the vegetation of this and the two next Regions, thus of the whole Cape Colony except the eastern coast region, is that of a number of low-growing scattered shrubs of a dark or blueish green hue. With considerable exceptions this is, nevertheless, the appearance which most commonly meets the eye. Almost everywhere the "bush" is present. There are vast tracts called the "Boschjesveld" (bush country), from the uniformity of this appearance. There, the chief bush is the "Rhenosterbush" (*Elytropappus rhinocerotis*); but these are intermingled with others, and in general they belong to the most various Orders. All have usually very small leaves, or of greyish green colour, or so covered with a dull coloured indument, as to produce at a distance a generally sombre aspect. On the coast the bushes are larger, ranging from 4 to 8 feet. The following genera are some of those which by their abundance largely contribute to make up the floral landscape:—Mundtia, Pelargonium, Agathosma, Celastrus, Cassine, Phylica, Rhus, Cyclopia, Borbonia, Aspalathus, Cliffortia, Berzelia, Brunia, Staavia, Tetragonia, Aster, Athanasia, Stoebe, Metalasia, Erica, Simocheilus, Myrsine, Euclea, Lycium, Lobostemon, Salvia, Penæa, Passerina, Leucadendron, Protea, Leucospermum, Serruria, Myrica, &c. Interspersed among these are

numerous plants of the orders Orchideæ, Irideae, Amaryllideæ, Liliaceae, with scattered tufts of Restiaceæ, sedges, and grasses.

In the deep ravines of the mountain sides are dwarf trees, growing closely, with dark foliage. Few indigenous trees attain a greater height than 25 to 30 feet; and amongst these is the Silver Tree (*Leucadendron argenteum*), peculiar to the Cape Peninsula. Forests are only met with towards the Knysna and Zitzikamma. These are chiefly composed of species of Podocarpus (Yellow-wood), Ocotea (Stinkwood), Ptæroxylon (Sneezewood), Olea (Olive), Elæodendron (Saffronwood), Cunonia (Rood Els), Virgilia (Keurboom), Olinia (Ironwood), Cussonia, Ficus, Grewia, Curtisia, Sideroxylon (Milkwood), Rhus, &c., &c. Those of which the vernacular names are quoted yield excellent timber. Trees of the Podocarpus occasionally attain a height of 50 to 60 feet; but few of the others exceed 25 to 30 feet.

There is little change in the aspect of the vegetation even at greatly varying heights on the mountains; and near the coast especially it is much less affected by altitude than is the case in Europe. On Table Mountain some species are found from the bottom to the top, having thus a vertical range of 3,500 feet; and there are many with a range of from 1,000 to 2,500 feet.

The flowering season begins about the end of May immediately after the first winter rains. The numerous species of Oxalis first made their appearance, and these are soon followed by great numbers of Irideae, Amaryllideae, Liliaceae, and other bulbous plants besides Mesembryanthemums and various Compositae. On the mountains the flowering begins later and continues longer; but though few plants may be found in flower in March and April, yet they are never wholly absent. The imported oak has shed its leaves for a period of six or eight weeks only (during May and June) before the new growth begins. Everything points to the fact that the true winter, the period of rest, is here the dry season, viz., March—May; as soon as rain falls even the winter temperature is sufficient, and vegetable life is at once aroused to activity.

A few of the most beautiful, striking, or curious vegetable forms of the region may here be mentioned, the majority of the examples being taken from the highly representative and rich flora of the Cape Peninsula, lying on its western extremity. The palm of beauty must be awarded to the *Disa grandiflora*, the grandest of southern terrestrial orchids, as *Cypripedium spectabile* is of the northern hemisphere. This is abundant on the streams of Table Mountain, and is found also on the Hottentot's Holland mountains, thirty to forty miles inland. Other fine orchids are *Satyrium corifolium*, a brilliant orange, *S. carneum* and *S. erectum*, *Disa longicornis*, a lovely blue, *D. secunda*, the delicate white *D. fasciata*, and others; *Pterygodium acutifolium*, a fine deep golden yellow, *Ceratandra*

chloroleuca, and *C. Harveyana;* the brilliant blue *Disa* (Herschelia) *graminifolia* (long known as *H. coelestis*) and the allied *D. venusta*, and *D. purpurascens;* and, finally, the small beautifully fringed spider-like *Bartholina pectinata* and *B. Ethelae*. Close upon these presses the so-called "Arum," the *Richardia africana*, with its pure white spathe,—almost as common an ornament of all moist low-lying ground as the common dock is an accompaniment of English ditches. The Proteas are universal objects of admiration, and few things can surpass *P. cynaroides*, with its flesh-coloured involucres, *P. speciosa*, *P. coccinea*, and a few others. The singular *Leucadendron argenteum*, or Silver Tree, is a striking ornament of the mountains about Cape Town. Next come the Heaths, whose names would be legion. The most beautiful, and those with the largest flowers, are denizens of the mountains lying between the Hottentot's Holland range and the town of Swellendam, being especially abundant about Caledon and Genadendal. On Table Mountain, *Erica cerinthoides*, *E. mammosa*, *E. coccinea*, *E. spumosa*, and *E. hirta* are amongst the finest, the latter sometimes making a whole mountain side glow with its warm pink tints. There are, probably 350 species of true heaths found in this Region alone. Amongst Compositae, *Gazania* has some fine species, while *Helichrysum vestitum*, *Helipterum*, spp., and *Phoenocoma prolifera*, are amongst the showiest of the everlasting flowers, the heads of the first-named being gathered, dried, and exported in large quantities to Europe as *immortelles*. *Dimorphotheca annua* has gay white rays, and, with some species of *Arctotis*, makes the fields look bright in spring. In the large Order, Leguminosae, *Podalyria calyptrata*, with its large rosy flowers, may, perhaps, lead the list, and *Virgilia Capensis*, *Cyclopia spp.*, *Hypocalyptus obcordatus*, and the wide spread *Sutherlandia frutescens*, are amongst the few handsome plants of an Order not remarkable for its beauty in this Region, but which consists for the most part of inconspicuous shrublets. The Acacias are deficient; only *A. horrida* occurring sparingly in the drier parts of the Region. The Pelargoniums are abundant, and several species, *P. cucullatum*, *P. betulinum*, &c., are very handsome. Oxalises with white, red, and yellow flowers, stud the fields in early spring. The numerous species of the tribe Diosmeae, including Diosma, Barosma (some of which as *B. crenulata*, &c., furnish the Buchu of medicine), Agathosma, Adenandra, &c., are mostly confined to this Region. The attractive *Rochea coccinea*, is one of the chief ornaments of Table Mountain; while the Cotyledons contribute some of the most curious plants of the Region, especially *C. fasciculatis*, with its smooth, thick, swollen tree-like stem; very abundant in the neighbourhood of Worcester and Hex River. Near the Tulbagh Waterfall occurs the rare and pretty *Ixianthes retzioides*, and in

the same neighbourhood, the curious *Roridula dentata*, a shrubby Droseraceous plant with extremely viscid leaves, which the farmers hang up in their houses in order to catch flies. The showy *Polygala oppositifolia* and *P. myrtifolia* are both widely distributed. Plants parasitic on the roots of others take a prominent position in our Flora. They include several handsome Harveyas, white, purple, and orange; and in other orders the *Cytinus dioicus*, the curious *Hydnora africana*; the foul smelling *Sarcophyte sanguinea* and *Mystropetalon* spp. Labiatæ are not plentiful, but *Salvia paniculata* and *S. nivea* are fine species. Turning to the *Monocotyledons*, Orchideæ have already been mentioned, Irideæ are abundantly represented in handsome species of Romulea, Geissorhiza, Ixia, Gladiolus, Watsonia, Babiana, etc.; Amaryllideæ in *Amaryllis Belladonna*, Nerine, Brunsvigia, Vallota, etc.; Scitamineæ in the peculiar and noble Strelitziæ. Liliaceæ are very varied and numerous. The most conspicuous are the Aloes,—*A plicatilis* with an arborescent trunk, attaining a height on the western mountains of 12 to 15 feet; the beautiful blue Agapanthus; the star-like Ornithogalums; *Kniphofia alooides*, and many others. *Prionium Palmita* is a remarkable plant with the flower of a Juncus, and the habit of a pine-apple, which in some parts fills the beds of certain western rivers, and reaches a height of eight or ten feet. Some Restiaceæ and Cyperaceæ attain to six or seven feet, and often form a striking feature in the landscape. Ferns are not very abundant, chiefly occurring in the deep ravines, where the arborescent *Hemitelia Capensis* is found several feet in height; and *Todea africana* forms a handsome plant. *Osmunda regalis* is sparingly met with, while *Pteris Aquilina* is more commonly scattered on the open hillsides.

It is in the orders and genera of plants exclusively or chiefly found here that the most striking differences are to be found between this and the other Regions of South Africa. An immense mass of observations has been collected, but has not yet been tabulated. It must suffice to say that this Region is distinguished by the comparative abundance of the Orders: Rutaceæ, Bruniaceæ Ericaceæ, Penaeaceæ, Proteaceæ, Irideæ and Restiaceæ; by the tribe Stilbeæ of the Order Verbenaceæ; and by the large proportionate number of the following Cape genera, of those richest in species, belonging to other Orders: Pelargonium, Oxalis, Phylica, Aspalathus, Cliffortia.

The following list of the sequence of Orders according to the numbers of species of each is chiefly based upon Drège's collections which were very large and general. He, however, or rather Ernst Meyer, considerably over estimated the number of species both of Restiaceæ and Irideæ; and to follow his results implicitly would be misleading. I have therefore framed the following list in which the position of those Orders has been reduced:—

1. Compositæ
2. Leguminosæ
3. Ericaceæ
4. Proteaceæ
5. Irideæ
6. Geraniaceæ
7. Gramineæ
8. Cyperaceæ
9. Restiaceæ
10. Liliaceæ
11. Orchideæ
12. Rutaceæ
13. Scrophularineæ

The fact of five such Orders as Ericaceæ, Proteaceæ, Irideæ, Geraniaceæ, and Restiaceæ, occupying so high a position, is sufficient to stamp this Region with a character peculiarly its own.

Very remarkable is the deficiency of Rubiaceæ. This Order, which is the fifth natural Order of the World, and the 2nd of India, does not only not find a place in the above list, but actually constitutes less than one per cent. of the total Flora. The following large Orders are also very poorly represented: Myrtaceæ, Aroideæ (each 1 species); Laurineæ (3 sp.); Acanthaceæ, Labiatæ and Asclepiadeæ.

No trustworthy calculation of the number of species occurring in the Region is available. Drège collected 2,914 species; I should estimate the total at about 4,500 species. The richness of certain localities is very great. On the Cape Peninsula alone, an area about one-fourth larger than the Isle of Wight, I have collected eighty species of Erica, and nearly one hundred species of Orchideæ; and the total number of species of flowering plants is probably nearly two thousand.

The affinities of the Flora of this Region with that of Australia, especially of South Western Australia, are very striking, and have already been shewn by Sir J. D. Hooker (loc. cit.), from the Australian point of view.

Two very distinct Orders: Proteaceæ, and Restiaceæ, are abundant in both regions, and, except for a few outliers, do not occur in any other countries: yet they have no single species, and only two or three genera, in common, out of many. Proteaceæ form the third Order of the Australian Flora, and the fourth of this Region. Diosmeæ, a large tribe of Rutaceæ abundant in this Region, find a counterpart in Australia, in the tribe Boronieæ of the same Order. The tribe Ericeæ of the order Ericaceæ, has over 400 species in this Region alone; not one occurs in Australia, but the place of the tribe is taken by the large Order Epacrideæ, closely allied to it, and which is almost confined to Australia.

The following table of the nine largest Australian Orders is taken from the same source, and is compared with the preceding list of the Orders of this Region. I carry the latter up to twelve, not being quite sure of the sequence of the smaller orders :—

Australia.	*S. W. Region, S. Africa.*
1. Leguminosæ.	Compositæ.
2. Myrtaceæ.	Leguminosæ.
3. Proteaceæ.	Ericaceæ.
4. Compositæ.	Proteaceæ.
5. Gramineæ.	Irideæ.
6. Cyperaceæ.	Geraniaceæ.
7. Epacrideæ.	Gramineæ.
8. Goodenovieæ	Cyperaceæ.
9. Orchideæ.	Restiaceæ.
	Liliaceæ.
	Orchideæ.
	Rutaceæ.

The number of identical genera in the foregoing orders is extremely small. Of species, not one is known to be common to both Regions. There is no genus of Rutaceæ or Proteaceæ; and only three of Restiaceæ (Restio, Leptocarpus, Hypolaena), common to both Regions. In other Orders the number of identical genera, if we except those of world-wide distribution, is extremely small. The following in Compositæ have been pointed out by Bentham (*Linn. Soc. Journ.* xiii, 552) :—

Brachycome	1	South African	36	Australian species
Helipterum	12	,,	30	,,
Helichrysum	137	,,	52	,,
Cassinia	1	,,	13	,,
Athrixia	6	,,	5	,,
Cotula	22	,,	9	,,

besides the cosmopolitan genera Senecio and Gnaphalium. Not all of these South African genera belong to this Region, nor any of them exclusively so; but Helipterum is very nearly restricted to it, while Helichrysum is widely distributed over the whole of Tropical as well as Southern Africa, though chiefly abundant in the latter. On this subject Bentham remarks (*l.c.* 553) :—"This approximation of the Compositæ of Australia and South Africa may possibly date from times less ancient than those in which they established a communication between the New and the Old World; and it may even have been less remote than the period in which flourished the common parents of Australian and South African Proteaceæ and Restiaceæ, or of Australian Epacrideæ and South-African Ericeæ; for it is exemplified not in tribes only, but also in identical genera and sections." Amongst Liliaceæ may be mentioned the recent discovery in this Region of Nanolirion, a close ally of Herpolirion hitherto only found in similar alpine situations in Australia, Tasmania, and New Zealand.

The following Orders, characteristic of Australian vegetation, abound most, after Australia, in South Africa: Thymeleæ, Haemodoraceae, Droseraceae (Hooker); and another point of approach is found in the remarkable deficiency in both countries of the widely diffused Orders, Rubiaceae, Laurineae, and Aroideae.

On the other hand there are certain remarkable divergencies, as pointed out in the following list, taken with modifications from Sir J. Hooker's Essay before quoted.

The following Orders are represented in the Flora of this Region, but are either comparatively rare or absent in Australia:—

Fumariaceae, absent in Australia	Ericeae, absent in Australia
Geraniaceae.	Selagineae, ditto
Caryophylleae.	Stilbeae (tribe *Verben.*) ditto
Rosaceae (Cliffortia).	Penaeaceae ditto
Bruniaceae, absent	Podostemaceae ditto
Crassulaceae.	Cytinaceae ditto
Dipsaceae, ditto	Piperaceae ditto
Campanulaceae.	Aloineae (tribe *Liliac.*) ditto

Temperate Australia contains the following orders that are rare or absent in this Region:—

Dilleniaceae, absent in S. Africa	Epacrideae, absent in S. Africa
Magnoliaceae, ditto	Loganiaceae
Tremandreae, ditto	Myoporineae, ditto
Stackhousieae, ditto	Monimiaceae, ditto
Sapindaceae.	Casuarineae, ditto
Halorageae.	Cupuliferae, ditto
Myrtaceae (1 species)	Coniferae
Caprifoliaceae, absent	Johnsonieae (tribe of *Liliac.*) do
Stylidieae, ditto	Xeroteae (tribe of *Juncac.*) do
Goodenovieae, (1 species)	

It is also noteworthy that whereas in the Orchideae of Australia it is the tribes Vandeae and Neottieae which most largely prevail (Ophrydeae being restricted to two species), in this Region the Vandeae are few, and Neottieae completely absent, while Ophrydeae abound.

Sir J. Hooker conjectures the probability of a common origin of the Australian and South African Floras, derived from ancestors inhabiting a vast antarctic continent, of which the greater part has been submerged. In connection with this it is not a little remarkable that geologists tell us that the surface of the S.W. Region consists of the older rocks which are known to exist in South Africa; the most recent being the Table Mountain Sandstone, which seems to be generally regarded as Devonian. But this hypothesis must be understood as referring exclusively to that portion of South Africa which is included in the Region I am

now treating of. The affinities of this Region with that of other countries are more obscure, are certainly very slight and have not hitherto been elucidated.

On the eastern boundary the Flora of this Region passes gradually into that of the Tropical African Region, and on the north, where, however the boundary is much sharper and more defined, into that of the Karroo Region.

The foreign vegetation naturalised in the Region demands a brief notice. I have made a list of about 158 species, of which the great majority are wide-spread European plants, with a few American and Indian species, which have been recorded as more or less naturalised throughout South Africa. The observations are imperfect as regards the eastern region, and the whole number would probably be nearer 200 species. Of these about 130 may be found within ten miles of Cape Town. Yet only the following can be said to occur in sufficient number in that locality to attract attention:—*Fumaria officinalis*, *Sisymbrium officinale*, *Brassica nigra*, *Raphanus Raphanistrum*, *Trifolium angustifolium*, *Serpicula repens*, *Sonchus oleraceus*, *Solanum Sodomaeum*, *Datura Stramonium*, *Nicotiana glauca*, *Rumex acetosella*, *Panicum sanguinale*, *Briza maxima*, *Pteris aquilina*. A species of prickly pear, *Opuntia Tuna?* which is very abundant and troublesome in the Karroo Region, occurs also in the drier eastern portions of this Region. *Pinus pinea* (the stone pine) *Pinus pinaster*, and *Quercus pedunculata*, have been largely planted, but cannot be said to grow spontaneously; although when once sown, the first named is one of the few introduced plants which can contend successfully against the indigenous undergrowth, in which the seed may be deposited without clearing, and which it at length overtops and finally destroys. Few of the introduced plants are found far from roadsides or human habitations, and it is remarkable how small upon the whole is the influence they exert upon the aspect of the vegetation, and how weak (with the sole exception of the *Opuntia* referred to) is their aggressive power as against the indigenous Flora.

THE TROPICAL AFRICAN REGION.

This Region occupies almost the whole portion of the continent which lies between the tropics. Owing to the warm and moist climate caused by the currents of the Indian Ocean, the Flora retains a sub-tropical character to an extent very much greater than that of the west coast; and the Region puts forth an arm, which reaches about as far south as Port Elizabeth, and the Van Staden's mountains. From the Zitzikamma forest on the one side, to the ending of the Zuurberg range near Graham's Town on the other, may be regarded as a debateable territory, where the present Region overlaps and intermingles with the South Western Region.

Generally speaking, its inland boundary appears to be the highest range of mountains which, under various names, and not always quite continuously, run parallel with the coast—the Boschberg, Kagaberg, Winterberg, Stormbergen, Quathlamba mountains, Drakensbergen, &c. Thus it includes the Colonial districts of Uitenhage and Somerset (in part), Albany, Bedford, Fort Beaufort, Peddie, Queen's Town, King William's Town, East London, and all the Transkeian territories, Natal, and Zululand, up to the tropic. The width of the Region ranges in this portion from 60 to 100 miles.

The physical features of the country may be easily understood if it be remembered that a lofty mountain chain, reaching from 5,000 to 10,000 feet in height, slopes down gradually to the sea, sending down numerous rivers which cut up the intervening country by their deep valleys. The surface of the country is extremely varied; large tracts of bush alternating with open grassy downs, grass and bush sometimes intermingled in park-like stretches. In the western portion (the Addo and Fish River) there are dense thickets of bushes 10 to 15 feet high; further eastward and northward these become forests, and in many parts the slopes of the mountains facing the sea are covered with woods to the summit.

The general aspect of the country is much greener and more luxuriant than that of the South Western Region.

The climate of a Region stretching from the tropic to 34° S is, of course, in some respects very different in different localities. At King William's Town, 1,300 feet above the sea, the mean annual temperature is about 18·9 C (66° Fahr.), the rainfall about 26 in.; further inland the rainfall diminishes; towards Natal the temperature gradually rises, and the rainfall is somewhat greater. At Pietermaritzburg, in Natal, at an elevation of 2,096 feet above the sea, the mean annual temperature was 18·25 C (64°·83 Fahr); the rainfall 30·23 inches; the humidity of the air 70·30 per cent. (9 *years' observations, Dr. Mann*). But the most striking difference between the climate of this and the South Western Region is the fact that the one has chiefly summer, the latter chiefly winter rains.

The gradual transition from the South Western to the Tropical Flora is noticeable in the bordering districts already named. The Cycadaceous Encephalartos (Kaffir bread) pushes one of its species along the ridges of the Zuurberg as far west as the pass known as Salt Pan's Neck. Leguminous plants begin to abound, especially the bush *Schotia speciosa* (Boer boon) a decidedly eastern type; and the same dry tracts are occupied by a succulent Euphorbia with four angled thorny stems, *E. tetragona* (Noorsdoorn). In the woods near the coast, from the Knysna eastward, epiphytic orchids begin to occur (Polystachya, Angræcum and Mystacidium). Genera be-

longing to Malvaceæ, Sterculiaceæ, Rubiaceæ, Asclepiadeæ, and Acanthaceæ, become more numerous, both in individuals and species. The only *Sterculia* hitherto known in the Colony, *S. Alexandri*, occurs in the Van Staden's Mountains, but has been found nowhere else. *Sanseviera thyrsiflora* covers the hill-sides over large tracts, and affords excellent fibre, at present the subject of experiments in rope manufacture. The beautiful *Calodendron Capense* (Wild Chestnut) a tree of the Order Rutaceæ, occurs throughout the Region ; it has been met with on the Zambesi, and even on the Kilimanjaro Mountain, a few degrees south of the equator. The number of trees of handsome foliage and showy flowers might almost be said to characterise the Region. I can only mention a few of them occurring in the Colony, Kaffraria and Natal :—*Boscia Caffra*, *Oncoba Kraussiana*, *Dombeya* (3 species), *Sparrmannia Africana*, *S. palmata*, *Turraea obtusifolia*, *Acridocarpus natalitius*, *Millettia caffra*, *M. Sutherlandi*, *Erythrina caffra*, *E. latissima*, *Sophora nitens*, *Calpurnia spp.*, *Schotia speciosa*, *S. brachypetala*, *S. latifolia*, *Gardenia spp.*, *Pavetta* (many species), *Burchellia Capensis*, *Alberta magna*, *Tricalysia Capensis*, &c. The number of flowering shrubs is also very considerable amongst Malvaceæ, Sterculiaceæ, Rubiaceæ, Asclepiadeæ, Scrophularineæ, Acanthaceæ, and many others. *Greyia Sutherlandi* is a curious Sapindaceous tree, with handsome crimson flowers, which extends from Kaffraria to Natal ; it is allied to the endemic genera Melianthus, Aitonia and Erythrophysa, the two latter belonging, however, to the Karroo Flora. *Oldenburgia arbuscula*, a singular looking composite of dwarf arboreous habit and very large flower heads, occurs along the Zuurberg range, but must rather be regarded as an outlier from the South Western Region, where it has two congeners, *O. Papionum* and *O. paradoxa*. Vernonia, which is almost entirely absent from the latter Region, begins to abound here, and increases in species as we proceed towards the tropic. The "everlastings" are well represented in many fine species of Helichrysum ; and even the *Elytropappus rhinocerotis* (the Rhenoster bush) has pushed up as far as Graham's Town. The Euphorbiaceæ begin to occur in considerable numbers in Albany and as will be seen presently, occupy a very important position in this Region. Amongst the succulent species is the noble *E. grandidens*, which attains a height of 30 feet or more in favourable situations, and forms a very characteristic feature in the the wooded ravines of the Region. The Coniferæ are not better represented than in the western districts—two Podocarpi (Yellow Woods), and the same *Widdringtonia cupressoides*, being all that occur. The Cycadaceæ have been mentioned already, but besides several species of Encephalartos there is the curious *Stangeria paradoxa* which comes down as far south as Lower Albany ; and here it may be mentioned that the same genial climatic influences bring a

Palm within our limits, *Phœnix reclinata* being found in the valley of the Kap River in the same district, this being probably its extreme boundary on the western side.

Amongst the Monocotyledons the Orchideæ have already been mentioned. The difference between the South Western Region and the present one is here again evidenced. In the former the species of the tribe Ophrydeæ largely predominate over the Vandeæ; here, the proportions are reversed. In Natal, *Eulophia*, *Lissochilus*, and *Polystachya*, are abundant in species, and take the place of the Disæ and Satyria of the west. *Calanthe natalensis* has lately been found as far south as the Perie Bush, near King William's Town. The *Strelitziæ* are found as far north as Natal, and may occur beyond that country. Some of the finest Irideæ belong to this Region, especially the Gladioli, *G. psittacinus*, *G. papilio*, *G. Saundersii*, &c. Amongst Amaryllideæ may be mentioned several fine species of Crinum, Brunsvigia, Hæmanthus and Clivia; of Liliaceæ the noble *Aloe Bainesii*, a tree of from 40 to 60 feet in height, and by far the largest and finest of the genus; also species of Gloriosa, Sandersonia, and Littonia. The Cyperaceæ and Gramineæ, as will be seen hereafter, yield a considerable number of species; *Prionium Palmita* occurs in Lower Albany; and amongst the latter Panicum and Eragrostis predominate. But beyond the statement that a large part of the intervening table land, (if that may be so called which is really a country of sloping downs) between the mountains and the coast, consists of grassy tracts, I have no information as to the predominance of particular genera or species in individuals.

Coming now to the composition of the systematic groups most prevalent in and characteristic of the Region, we possess three considerable collections. That made by Drege, some fifty years ago, included 2,278 entries of flowering plants, and was collected over the whole area of the three Districts into which he divided the Region. Many of the entries are, however, of the same species, collected twice, or even thrice; so that it is only available for use as a whole, and even then upon the assumption that the number of species collected more than once, in each Order, bore an equal proportion to the whole. Secondly, a list of 1,193 plants, collected in Albany district, mostly round Graham's Town, by my friend Professor MacOwan, and which he has kindly given me for this purpose. Lastly, a list of 1,320 species collected by Mr. J. M. Wood in and near the Inanda, not far from Durban, Natal.

A few explanations are necessary respecting these collections. It is true that the broadest result would have been obtained by amalgamating them; but this would have required more time than is available to me. The collection of Drege, being made over the widest area, should be the most representative; but it is

certain that the Orchideæ were neglected by him. In MacOwan's collection there are 46 distinct species of Orchids; in Drege's only 41 entries over the whole area, including duplicate entries of the same species. In Wood's collection the Orchids probably occupy too high a place; many in his list were not named; I counted them, necessarily, as distinct species, when doubtless some were repetitions of the same species. On the other hand, the Cyperaceæ and Gramineæ in his list, reaching to only 2·2 and 1·4 per cent. respectively, have clearly been collected much below the average. With these remarks, I think it will be better to give the three lists, side by side; and in some respects, it will be more instructive, since a comparison of Wood's and MacOwan's well illustrates the known increase, as we proceed nearer to the tropic, of the Orders Rubiaceæ, Euphorbiaceæ and Acanthaceæ, and the decrease of Ficoideæ and Geraniaceæ :—

Drege's List. *General.* Per cent.		MacOwan's List. *Local.* Per cent.		Wood's List. *Local.* Per cent.	
Compositæ ..	14·	Compositæ ..	17·5	Compositæ ..	13·1
Leguminosæ ..	9·9	Leguminosæ ..	7·6	Leguminosæ ..	8·4
Gramineæ .	7·7	Gramineæ	6·9	Liliaceæ ..	5·
Cyperaceæ ..	4·5	Orchideæ	3·8	Orchideæ ..	4·2
Asclepiadeæ ..	3·1	Scrophularineæ ..	3·1	Rubiaceæ ..	4·
Labiatæ ..	3·	Asclepiadeæ ..	3·1	Euphorbiaceæ ..	4·
Euphorbiaceæ	2·8	Cyperaceæ ..	3·	Asclepiadeæ ..	3·9
Rubiaceæ ..	2·7	Grassulaceæ ..	2·9	Acanthaceæ ..	3·1
Scrophularineæ	2·6	Geraniaceæ ..	2·4	Irideæ	2·8
Liliaceæ ..	2·6	Euphorbiaceæ ..	2·	Scrophularineæ	2·2
Acanthaceæ ..	2·4	Irideæ	2·	Cyperaceæ ..	2·2
Malvaceæ ..	2·2	Liliaceæ	2·	Labiatæ	2·2
Irideæ ..	2·	Ficoideæ	2·	Celastrineæ ..	1·8
Orchideæ ..	1·8	Rubiaceæ	1·8	Gramineæ ..	1·4
Anacardiaceæ	1·5	Umbelliferæ ..	1·8	Malvaceæ ..	1·3

The difference between any one of these lists and that of the South-Western Region will be apparent at a glance: Ericaceae, Proteaceae, Restiaceae, and Rutaceae do not appear in the former at all; and Geraniaceae in only one of them, viz., that one collected nearest to the South-Western Region; while the position of the other Orders common to both, excepting Compositae and Leguminosae, is widely different. Wood's list includes 2 Rutaceae, 7 Ericæ, 2 Proteaceae; Bruniaceae and Restiaceae are entirely absent from it. About Graham's Town, however, MacOwan found 6 Rutaceae, 1 Bruniacea, 8 Ericæ, 6 Proteaceæ, 6 Restiaceæ. The two Regions appear to overlap widely; a few Ericaceae have been found on the mountain tops nearly up to the tropic, and one or two Proteæ occur in the Transvaal; while outliers of a tropical type penetrate the South Western Region as far as the Knysna forests, and even a little beyond.

I have not sufficient data of the Flora of tropical Africa, as a mass, to attempt to trace the affinities between it and the South Western Region. So far as that portion of the former is concerned which stretches south of the actual tropic, and constitutes the subject of the present sketch, there is an agreement in the fact that Compositae and Leguminosae occupy respectively the first and second place amongst the Orders of each Region, as they do amongst the Orders of the whole World. This is important when we bear in mind the undoubted affinity which exists between the Flora of Tropical Africa and that of India, because in the latter country the Orders Leguminosæ and Rubiaceæ take the first and second place. The similarity, in other respects, will be shewn if we compare the sequence of Orders in India with that of Wood's Natal list :—

India (*Hooker*)	Natal (*Wood*)
Leguminosæ	Compositæ
Rubiaceæ	Leguminosæ
Orchideæ	Liliaceæ
Compositæ	Orchideæ
Gramineæ	Rubiaceæ
Euphorbiaceæ	Euphorbiaceæ
Acanthaceæ	Asclepiadeæ
Cyperaceæ	Acanthaceæ
Labiatæ	Irideæ

If it be remembered that, as I have said above, Wood's list is certainly unduly deficient in Gramineæ and Cyperaceæ, which should probably be included in the above, and would throw out the two lowest orders, it will be seen that there is a considerable agreement between the two.

The lists of Drège, MacOwan, and Wood, given above, contain comparatively few naturalized foreign plants; yet we may not infer that they exist only in such proportion; and exact information is, in fact, wanting. My own personal acquaintance with the Region is somewhat limited, extending only for about 150 miles of its south-western extremity. In the parts I have seen, introduced plants, excepting *Opuntia Tuna* (?), in some of the drier western parts of the Uitenhage district, *Xanthium spinosum* occasionally, and *Nicotiana glauca*, are few in individuals, and exert but a very small influence upon the aspect of the Flora. They do not appear to differ much in character from those that have been referred to under the South-Western Region. In Wood's list, however, there are certain tropical weeds which, as might be expected, do not occur in the older Colony.

THE KARROO REGION.

This Region includes on the west side the coast strip of Namaqualand lying between the mountains and the sea. How

far it may extend north of the Orange River is unknown. Southward it stretches between the Khamiesbergen and the sea, and thence passes over by tracts little known botanically, to the south and west slopes of the Roggeveld mountains. Here it widens out and includes all that large tract known colonially as the Karroo; bounded on the north by the Roggeveld, Nieuwveld and Sneeuwberg mountains, on the east by the mountains fringing the Fish River; on the south by the Zwarteberg range, Kamanassiebergen, and finally the Zuurbergen, and on the west by the mountains of the Warm and Cold Bokkeveld.

Speaking broadly, it is a vast, shallow basin, surrounded by mountains; but the mountains, while always loftier on the northern side, are sometimes a mere rim on the southern. Its height above the sea ranges from 1,800 to 2,500 feet. But for the purposes of floral computations I have reckoned all plants collected on the southern slopes of the northern mountains, up to a height of about 3,750 feet, as belonging to this Region. Above that height, in certain localities, at least, the vegetation changes, and belongs to the next (the Composite) Region.

It is traversed by numerous river-beds or torrents, mostly dry or nearly so, except when filled by the summer thunderstorms, when the beds suddenly fill, carry off a vast quantity of muddy water for a few days, and soon again become dry. But water, generally, is scarce, and springs are infrequent.

The country has been subjected to long ages of denudation by rains and rivers, and exhibits its traces everywhere. It is probable that since the interference of man, which, by sheep pasturage has killed much vegetation and loosened and opened the soil, this denudation has proceeded more rapidly, and in some places enormous gullies have been formed where previously moist and fertile valleys existed. The surface consists chiefly of vast plains of light, reddish soil, which, when irrigated, is extremely fertile; in other parts it is more sandy, and in some places the soil is shaly, hard and barren. The plains are, however, broken by hills or mountains, sometimes with flat tabular tops. Everywhere the exposed rock is sandstone in beds, of varying colours and hardness, which have been regarded by Wyley and Dunn as belonging to the carboniferous measures. In the north eastern portion these are traversed by frequent doleritic dykes, which are sometimes vertical, and sometimes lateral, forming cappings to the sandstone hills.

The climate is one of great dryness and extremes of heat and cold. The following observations have been recorded at Graaff-Reinet, a town on the northern edge of the region, 2,476 feet above the sea:—Mean annual temperature 18° C. (64·41 Fahr.); mean of greatest range on any one day 3°·26 C. (37°·88 Fahr.); extreme limits of temperature (Dec. 20) 40°·55 C. (105° Fahr.);

June 24, 3·56° C. (28° Fahr.); rainfall 13·19 in., of which about two-thirds fell during the six summer months. The foregoing are from three years' observations. Twenty-three years' observations give an average of 14·5 in. of rain. Other observations of rainfall for other stations in the region for at least five years are:—Prince Albert, 7·71 in.; Beaufort West, 9·19 in.; Willowmore, 7·40 in.; Aberdeen, 12 in.; Jansenville, 9·44 in.; Springbok (Namaqualand), 8·05 in. The following are from one year's (1883) observations only:—Port Nolloth, 2·66 in.; Touws River Station, 8·86 in.; Matjesfontein, 10·21 in. The greater part of the rains take place during the summer thunderstorms; occasionally, in the Eastern portions, a strong south-east wind brings up general rain, but this is rare, the clouds being usually discharged in the intervening mountain ranges which divide this Region from the two coast Regions, and intercept its rains.

During periods of drought nothing can be imagined more desolate and mournful than the appearance of the vegetation. The soil is rarely covered, bare patches of greater or less extent intervening between shrubs and bushes. These are frequently blackened by drought as if they had been killed by fire. The largest and indeed almost the only trees are those of the *Acacia horrida* (Doornboom) which line the banks of the dry river beds as with a fringe; and occasionally, on the higher mountain sides, a few other trees of shrubby habit occur. For the most part the shrubs are scattered, and range from 5 to 8 feet in height; with intervening shrublets of 1 to 2 feet. Yet after copious rains all will be changed within a week or two, as if by magic. Many of the apparently dead bushes put forth bright green leaves; the shrublets are covered with flowers often before leaves can be seen; bulbous plants, which may not have flowered for several years previously, send up their scapes with incredible rapidity, and annual flowering herbs and grasses are everywhere seen where formerly all was bare and barren. Namaqualand, perhaps, exhibits this phenomenon to the most striking extent. I was amazed on visiting that desert country after the rains of June to July, 1883, to see tracts, hundreds of acres in extent, covered with sheets of living fire, or glowing purple, visible from several miles distance, caused by the beautiful Compositæ in flower; and nothing is more singular than to see this luxuriance intermingled with the black or white branches of dead shrubs killed by previous droughts, standing like ghostly intruders on a scene of merriment and joy. These charming displays pass away all too rapidly, and in a month or two little that is beautiful remains.

I proceed to speak of a few of the chief plants of the Region most noteworthy, either from their beauty, singularity, or from their being confined to, or peculiarly characteristic of it. I am best

acquainted with the Karroo of the Graaff-Reinet district, partly with that of Namaqualand, and for the rest have only passed through it as a rapid traveller. Several species of Heliophila are extremely bright in spring, especially in the west; and the monotypic *Palmstruckia Capensis*, which had only been gathered before by Thunberg, has just been re-discovered in Namaqualand. *Cadaba juncea* with its dark crimson flowers is a singular and characteristic plant both of this and the next Region; while *Capparis oleoides* (the Witgat boom) standing generally alone, 10 to 15 feet high, with its white trunk which has given its vernacular name, is a prominent feature of many of the Karroo plains; the young buds are nearly or quite as good for culinary purposes as those of the Caper of Southern Europe. The Portulaceae occupy a prominent place chiefly by the well-known *Portulacaria afra* (the *spek boom*, or fat tree), a large shrub with fleshy acid leaves and panicles of small pink flowers. This occupies the hill sides, often growing sub-socially in great masses and affording the most favourite food for live-stock of all kinds. It also occurs, though less abundantly, in the Tropical Region. In addition there are several species of Anacampseros, one of Talinum, and one of Portulaca besides the ubiquitous *P. oleracea*. *Tamarix usneoides* occurs in Namaqualand, where it is used as fuel, and is the only plant of the Order in our Region; it is recorded also by Drege as from the central and eastern Karroo. Amongst Malvaceæ are four species of Hibiscus, one of the most curious of which is *H. urens*, which looks at a short distance so much like a plant of the gourd family that every botanist is astonished to find upon it the flowers of a Hibiscus. Burchell says his Hottentots called it *Wilde Kalabas* (Wild Calabash). Of Sterculiacæ, the genera Hermannia and Mahernia, are represented by 10 and 5 species respectively. The large Order Sapindaceæ includes *Pappea Capensis* (the Wild Plum) a shrub of 15 or 20 feet frequent on mountains sides; *Aitonia Capensis*, also a shrub, the curious pendulous papery capsules of which look like miniature Chinese lanterns hung on a Christmas tree; the allied and even handsome *Erythrophysa undulata*, of Namaqualand; and several species of Melianthus. The Geraniaceæ are a numerous Order. The curious candle-bush, *Sarcocaulon Patersoni* is here, besides numerous species of Pelargonium. The latter are especially frequent in individuals, and much diversified in structure, those with succulent stems and leaves constituting a marked feature of the Flora. These include *P. oblongatum*, a handsome species from Namaqualand, with yellow flowers, lately figured in the Botanical Magazine (t. 5996), *P. flavum*, *P. carnosum*, *P. crithmifolium*, *P. ferulaceum*, *P. pulchellum*, *P. sericeum*, *P. quinatum*, the very curious and rush-like, almost leafless, *P. tetragonum*, *P. peltatum*, *P. echinatum*, and many others. The Oxalideae, though numerous,

and often brilliant, are less common than in the South Western Region. The Rutaceae are conspicuous by their absence. I never found but one species in the Region, a Diosma, on the mountains of Namaqualand, evidently a straggler from their great home further South. The Zygophyllums are frequent and mostly with succulent leaves; of the same family is *Augea Capensis*, a monotypic genus peculiar to the Central Karroo and abundant in many places, with thick terete leaves like those of a Mesembryanthemum. Phylica, so common in the South Western districts, is here absent; one or two species hover on the boundary line of some of the mountains, but they are scarcely members of this Region. Anacardiaceæ are only represented by Rhus, of which there are about a dozen species. The Leguminosæ do not occupy nearly so prominent a place here as elsewhere. There are, however, several species of Lotononis, Lebeckia, Indigofera, Rhynchosia, the widely distributed *Sutherlandia frutescens*; and *Sylitra biflora*, found in this Region only. *Schotia speciosa*, an outlier of the Tropical Region, occurs sparingly. *Acacia horrida*, the only species of this genus within our limits, is scattered widely, but especially fringes the river beds, the timber is largely used for fuel, and the bark for tanning. The almost complete absence of Aspalathus is very remarkable. Of Rosaceæ there are but two species of Grielum; while Cliffortia and Rubus are both absent. Crassulaceæ are an important constituent of the Region, Crassula and Cotyledon being numerous both in species and individuals. It is the Order Ficoideæ, however, that we may regard as the one most typical of the Region. Mesembryanthemums are met with everywhere, from the annual herb to the shrub with leaves of the most diverse and curious shapes, with flowers of white, yellow, and reds of many shades. In some portions vast tracts are covered with *M. spinosum* growing sub-socially almost to the exclusion of anything else. In Namaqualand is a huge species resembling *M. crystallinum*, but as large as a cabbage. Some of the larger flowered species are extremely brilliant. *Cussonia spicata* and *C. paniculata* are trees of the order Araliaceæ with congeners spread over the whole Colony. Rubiaceæ are here, as in the S. W. Region, remarkably deficient, not more than half a dozen species occurring near Graaff-Reinet. Of Compositæ the larger genera are Pteronia, Pentzia, Helichrysum, Senecio, Othonna, Euryops. Those most abundant in individuals are *Aster filifolius*, *Chrysocoma tenuifolia*, *Adenachaena parvifolia*, *Pentzia virgata*, and *P. globosa*, *Eriocephalus glaber*, Helichrysum spp.; most of them are very aromatic, and, excepting the second, furnish excellent food for live stock. In Namaqualand a large species of Didelta, *D. spinosum*, is used as a substitute for spinach, and is eaten greedily by all animals. Several species of Arctotis, Venidium, Gorteria, &c.,

are exceedingly brilliant, and make a great display after rains. Ericaceæ are entirely absent. *Olea verrucosa* is one of the few trees of the Region occurring sparingly in mountain ravines, and furnishing the most useful wood for fencing poles and for fuel. Of the order Ebenaceæ there are several species of Royena and Euclea. Some genera of Asclepiadeæ seem to indicate an affinity with the Tropical Region and India. Such are Gomphocarpus, Sarcostemma, Ceropegia. Of the genus Stapelia there are many species, thinly scattered, besides Huernia, Piaranthus, Decabelone, and the remarkable Hoodiæ of Namaqualand. *Adenium Namaquanum* (or Elephants' Trunk) is a curious Apocynaceous plant of the same country. Gentianeae are almost, if not entirely, wanting. Scrophularineae occupy a comparatively poor place,—Diascia, Nemesia, Lyperia being the chief genera, with some of the root parasites Alectra, Striga, and *Hyobanche sanguinea*. *Rhigozum trichotomum* is a handsome Bignoniaceous shrub. Acanthaceae are very deficient and probably constitute less than one per cent of the whole Flora. Selagineae are also few; *Selago leptostachya* (*Aarboschje*) is one of the good stock food plants. The ashes of *Salsola aphylla* (*Kanna-bosch*) are used for soap making; and *Atriplex Halimus* and *A. Capensis* (*Vaal-boschje*) are considered most valuable food plants for sheep and goats. *Hydnora Africana* occurs in the eastern, and *H. triceps* in the western Karroo. Santalaceae are represented in *Osyris compressa*, the leaves of which here and in the two preceding Regions, are very generally in use for tanning; there are also several species of Thesium. Euphorbiaceae are chiefly confined to succulent Euphorbiae, in many forms,—melon shaped, 4-angled, many-angled, and club-shaped, in some tracts immensely abundant in individuals. During severe droughts *E. Caput-medusae* (*Fingerpoll*) is in some places cut up as food for cattle; as is also a spinous species (*Euphorbia sp.*) after the spines have been previously burnt off. Several species of Viscum, and a few Loranthi occur; *Forskohlea candida* seems to be peculiar to the Region. There are one or two species of Ficus; and the widely distributed *Salix Capensis* occurs along many of the river banks. Coniferae are entirely absent.

Orchideæ are scarce. In the whole eastern Karroo I found but one species, *Habenaria arenaria*; but in Namaqualand on the mountains where the average rainfall does not exceed seven inches yearly, I saw a Holothrix, *Satyrium pustulatum*, *Pterygodium Volucris*, *and Disperis purpurata* var. Of Hæmodoraceæ, *Sanseviera thyrsiflora* is common on many hill sides, but rarely flowers. It may here be mentioned that this is a common condition of many of the Karroo Monocotyledons. They pass years in a dormant state: not until rain and temperature coincide suitably to their

need will they flower. Hence one may live seven years near a mountain side, and then first see it nearly covered with *Hesperantha falcata*; or one may watch the numerous bulbs of *Ammocharis falcata* in leaf for ten years, as I have done, and never see them in flower. Irideæ and Amaryllideæ are neither by any means abundant in species or individuals. Liliaceæ are much richer, and include Aloe (of which there are many fine species, *A. dichotoma* of Namaqualand being one of the largest) Haworthia, Apicra, Ornithogalum, Albuca, &c., in great variety and beauty; there are also many Asparagi. *Testudinaria elephantipes* is one of the best known and most curious plants of the Region. Juncaceæ are scarce; Cyperaceæ also but few, while Carex is entirely absent. Of Restiaceæ, also, none have been found. Gramineæ are somewhat rich in species, and occupy the second place amongst the Orders of the Region; yet they occur chiefly in isolated tufts, and rarely except in some specially favoured spot can anything like turf be seen. They belong to many genera amongst which may be named Panicum, Andropogon, Aristida and Eragrostis.

Of Ferns there are perhaps 8 or 10 species in the whole Region. These are chiefly Cheilanthes, Pellaea, and Nothochlaena; most of them are peculiar to the Region, and five at least, according to Lady Barkly, are found in Namaqualand only.

The predominating feature of this Region is the peculiar adaptation of its vegetable life to meet the severe conditions of the dry and hot climate and soil. Succulence, which may here be taken to include thickened roots, stems or leaves, is displayed in the most diverse Orders. At Graaff-Reinet, on the north-eastern border of the Region, and where the climate is far less severe than further west, I counted thirty-one per cent. of all flowering plants as more or less succulent. In the central and western Karroo the proportion would be much larger. The prevalence of thorny plants is also very noticeable.

The following list of the chief Orders of the Region is taken from a list of 611 flowering plants collected by me mostly near Graaff-Reinet, all below 3,750 feet above the sea, and being nearly a complete collection of the plants within twenty miles of that centre; to which are added 66 others collected by Drège, and by myself, in other parts of the Region, further south and west. But it does not include plants from Namaqualand, nor from the western Karroo generally. Substantially, it is a fair representation of the eastern Karroo; but I think it probable that a fuller and more general collection would reduce the position of Gramineae, raise that of Ficoideæ and Geraniaceæ, and introduce the order Irideæ into the first twelve.

CHIEF ORDERS—EASTERN KARROO.

	Per cent.
1. Compositæ	17·1
2. Gramineæ	9·2
3. Ficoideæ	6·8
4. Liliaceæ	6·5
5 Crassulaceæ	5·3
6. Leguminosæ	3·8
7. Geraniaceæ	2·9
8. Scrophularineæ	2·9
9. Asclepiadeæ	2·5
10. Sterculiaceæ	2·5
11. Solanaceæ	2·2
12. Cyperaceæ	2·

The Flora shows but weak affinities with either of the two preceding Regions, and these are chiefly exhibited in widely distributed genera common to the whole of Southern Africa. From the South Western Region it differs in the complete absence of Rutaceæ, Bruniaceæ, Ericaceæ, Proteaceæ, Penaeaceæ, and Restiaceæ, the six most characteristic orders of that Region; further, in the scarcity of Leguminosæ; and in the almost complete absence of the following large genera which are so abundant in and characteristic of that Region: Muraltia, Phylica, Aspalathus, Cliffortia, Athanasia, Arctotis, Gnidia, Struthiola. There is a point of approach in the abundance of Geraniaceæ; and there is a common scarcity of Rubiaceæ and Acanthaceæ. From the Tropical Region it is distinguished by abundance in Ficoideæ and Crassulaceæ; and by its paucity of Leguminosæ, Rubiaceæ and Acanthaceæ; to these might perhaps be added Malvaceæ, and Euphorbiaceæ, for these occur chiefly in the eastern Karroo, where it borders on the Tropical Region. It may hereafter be found that the affinities of this Region, together with the succeeding one, are greater with the Kalahari Region than with any other, if indeed they might not be regarded as an extension of it. But at present our knowledge of the Kalahari is too imperfect to enable us to form a judgment.

With respect to the naturalized foreign plants of the Region, it may readily be supposed that the heat and drought of the climate would be unfavourable to European colonists. The number is indeed few, and chiefly confined to weeds of cultivation, which is here synonymous with irrigation; or to a few wayside weeds. The number known to me does not exceed twenty-five. Those of American origin are more prominent. *Opuntia Tuna* (?) already mentioned, has a branched stem with obovate articulated joints, covered with tufts of strong prickles; the flowers are yellow, and the fruit much eaten by the natives and colonists. Drège does not mention this plant, so that it must have been introduced, or, at least, have spread, since his visit (1826-1834). It is now a most troublesome pest, growing in some places sub-socially, and killing

out the native vegetation. So tenacious of life is it that a piece of stem of a few square inches dropped upon the surface of the hot dry soil, will take root and grow readily. Cattle and goats, driven to browse upon it by drought, suffer by the laceration of their mouths, and fall off in condition. Its eradication is slow and laborious, needing either to be completely buried, or burnt. The *Xanthium spinosum* is also a troublesome weed owing to its hooked achenes becoming entangled in the wool of sheep. *Nicotiana glauca* springs up immediately wherever quarries are opened; *Argemone Mexicana* has fairly established itself, though not yet abundant; and *Amsinckia angustifolia*, from Chili, has been found in Namaqualand.

THE UPPER REGION, OR REGION OF COMPOSITES.

This Region is bounded on the west by the Hantam and Roggeveld mountains; southward by the continuation of the Roggeveld range; the Nieuwveld, the Sneeuwberg range; thence across by the Boschberg and by the mountains about Daggaboer's Nek, towards the north-western flanks of the Great Winterberg mountain; eastward by the watershed which separates the waters of the Fish River from those of the Kei, so as to include the districts of Tarkastad and Albert, to the Orange River. Its northern boundary is in part unexplored. I am informed by Mr. E. J. Dunn, F.G.S., who has travelled through that part of the country for the purpose of exploring its geology, that the boundary line on the northwest is well marked and co-incident with the line of his Dwyka Conglomerate and the Karroo Beds, the former being covered by the Twa-grass (*Arthratherum brevifolium*) so characteristic of the Kalahari Region, while the latter bear the stunted bushes peculiar to this Region. This line would begin near the Kabiskouw mountain, thence it extends in a curve towards Hope Town where it is certainly existent about thirty miles south of that town. It then runs northward, crossing the Orange River. The exact boundary in the Orange Free State is unknown to me, but it is probable that it takes a wide curve eastward between Bloemfontein and Smithfield, and again cuts the Orange R. southwest of Aliwal North. It is thus an elevated country sloping gently from the southern edge towards the Orange River, at an average elevation of from 5,000 to 4,000 feet above the sea. I have included in the Region that part of the districts of Middelburg, Cradock and Tarkastad, which is formed by the basin of the Great Fish River above Dagaboers Neck. Is it uncertain whether this is correct. Drège regarded this tract as belonging to the Karroo Region; but he passed rapidly through it (as I have also done) and scarcely collected anything. His view would have this consistency: that it would make the waters of the whole Upper Region run into the

Orange River; and those of the whole Karroo Region into the Southern Ocean. But the tract in question is somewhat more elevated than the rest of the Karroo, and appeared to me from its deficiency in succulents to belong rather to the present Region. The matter must be decided by further evidence, since no collections, so far as I know, have been made there.

The general aspect of the country is that of a vast treeless plain, interspersed at great distances by a few isolated and flat-topped mountains, or short ranges; or lower, and then very rugged rocky hills. On these hills or in the few ravines of the monotonous mountain sides, may be found a few stunted bushes. In fertile shallow vallies ("vleis"), grassy patches, with more luxuriant bushes 6 to 8 feet high, may be seen; but trees never, except such few as have been planted by the hand of man; or except the few (chiefly *Salix capensis*) which fringe the banks of the Orange River, where it flows through this Region; and the predominant and constantly prevailing aspect of the country is that of a heathy tract, or dry elevated moorland, covered with small shrublets of a dull green hue, the few intervening plants of different growth which occur being too small or too few to alter or modify the general appearance above described.

Respecting the climate of this Region no observations for any considerable length of time, excepting of the rainfall, have been made. The extremes of temperature are considerable, the summer maximum being nearly as high as in the Karroo Region although the summer nights are always cool; while the winter temperature is much lower. Severe frosts are common, with occasional snows in winter and hailstorms in summer. The rains are almost entirely in the summer months, and usually accompanied by thunderstorms. The following list of stations at which the rainfall has been observed for a period of five years or more is taken from the Report of the Meteorological Commission for 1883. I take the stations in their order from west to east:—Fraserburg, 6·11 inches; Carnarvon, 7·78; Victoria West, 9·82; Richmond, 11·64; Hanover, 13·77; Middelburg, 14·17; Colesberg, 12·82; Cradock, 13·19; Tarkastad, 17·08.

The following remarks on the plants chiefly characteristic of this Region are based upon collections of 507 species of flowering plants made by myself chiefly on the loftier portions of the Graaff-Reniet district (above 3,750 feet above the sea) with a few in the districts of Murraysburg, Richmond, Hanover and Colesberg; of 331 (other) species collected by Drège in the same districts, together with Albert and Aliwal North; and of 135 (other) species collected by Mr. W. Tyson, chiefly in the district of Murraysburg; being a total of 973 species. These lists and the calculations upon them, which will be found on page 313, were made some time ago. I have

since doubted whether the higher mountain regions of the Sneeuwberg, and of Aliwal, should not rather be regarded as outlying tracts of the Tropical Region; the conditions of greater moisture favouring the extension of eastern types which do not occur in the immediately contiguous lower levels. The same conditions have permitted the lodgment of a very few south-western types. The result is to make the Region appear more rich in forms than it otherwise would be, to the extent of probably 15 per cent. of the species, and 6 per cent. of the genera; and in so far to increase the appearance of its affinities with the Tropical African Region. I regret that time does not allow the revision of the list, and that this statement must suffice.

The Geraniaceæ are fairly numerous, but do not here occupy, either as to singularity of form, or in respect of the number of individuals, the same prominent position they hold in the preceding Regions. One Rutacea, *Barosma venusta*, occurs on the Koudveld Mountain, at about 6,000 feet; also two Phylicae on the mountains near Graaff-Reinet. The species of Rhus (*Taai-bosch*) are numerous, 13 being recorded in our list. Leguminosae are mostly small and inconspicuous shrublets of the genera Lotononis, Argyrolobium, Indigofera, and Lessertia. *Lessertia annularis* is said to have poisonous effects upon cattle. The only handsome plant of the Order, which has here 19 genera and 52 species, is the widespread *Sutherlandia frutescens*. *Acacia horrida*, the only tree of the Order, and the only species of that genus occurring in the Region, hardly belongs strictly to it, being found only sparingly in sheltered valleys of the Sneeuwbergen, &c. A few species of Cliffortia are outliers of the South-western type growing only on the highest mountains. Crassulaceæ, similarly, though our list includes 33 species, are found very sparingly everywhere except upon the southern border of the Region; and are few in individuals. *Guthriea capensis* is a curious Passifloraceous plant with the habit of a Primrose, only found hitherto upon the highest parts of the Sneeuwbergen. Ficoideæ are very deficient in individuals, and the majority of those in our lists belong to the warmer parts about Murraysburg. Rubiaceae have 11 species only, chiefly of Anthospermum, Rubia, and Galium. It is in Compositae that we find the great strength of this Region, there being not less than 61 genera with 231 species. The largest genera are Helichrysum with 36 species; Senecio with 35 species; Berkheya, 11; Euryops, 10; Pentzia and Gazania each 8 species. The species most numerous in individuals are *Chrysocoma tenuifolia*, a small shrublet of little or no value for stock, covering vast tracks in the central part of the Region not indeed sociably, but intermingled with others, also, for the most part, Compositæ; *Helichrysum hamulosum*, *Eriocephalus glaber*, and other species; *Pentzia globosa*, *P. Burchellii*, *P. Cooperi*,

all good stock plants; *Othonnopsis cluytiaefolia* and *O. pallens*; *Euryops spp.*; *Gamolepis trifurcata*; *Tripteris leptoloba*, *T. spinescens*; *Arctotis stoechadifolia*, &c. Five species of Ericaceæ are found on the highest mountains only. Ebenaceæ have five species of Royena and Euclea, usually stunted rigid bushes. *Olea verrucosa* (the Olive) is sparingly distributed, and grows very poorly. Of Asclepiadeæ there are twelve genera and 27 species. Three species of Lycium are scattered, and one of them is a characteristic shrub of the bleak and dreary Roggeveld. Scrophularineæ are well represented in 20 genera and 38 species, of which the beautiful deep blue flowers of *Aptosimum depressum*, and the sky blue *Peliostomum origanoides*, alone deserve notice, and are worthy of cultivation. *Rhigozum trichotomum* is a Bignoniaceous shrub with handsome yellow flowers, belonging to this as well as to the Karroo Region. Acanthaceæ are deficient, having only 5 species; Selagineæ, 15; Labiatæ, 18; Thymeleæ only 7, of which *Arthrosolen polycephalus*, a useless wiry shrub, grows almost sociably in some spots. *Salix Capensis* is only found in a few sheltered valleys in the lowest part of the Region, or on the banks of the Orange River.

Amongst the Monocotyledons Orchideæ have four species all of the higher mountains. Irideae are greatly diversified, having 12 genera and 20 species. Amaryllideæ are nearly as many, *Brunsvigia multiflora* being one of the handsomest, and there are several species of Hypoxis mostly from the eastern mountains. Aroideæ are entirely absent. Liliaceæ are numerous; Aloes are very few; and there are several species of Kniphofia (4); Scilla (4); Ornithogalum (4); Bulbine (5); Asparagus (7); in all 20 genera with 47 species. Of Restiaceæ, 3 have been found on the highest mountains, outliers from the S.W. Region. Cyperaceæ have 22 species, including 2 Carices. Gramineæ occupy a high position with 37 genera and 78 species. Though thus highly diversified they do not occupy a prominent place in the landscape of the country, everywhere occurring in isolated tufts, usually far apart from each other. Those most abundant in individuals appear to be *Andropogon marginatus*, *Anthistiria ciliata*, *Aristida vestita*, &c., *Danthonia disticha*, *D. villosa* and others, *Eragrostis brizoides*, *E. striata*, *Melica dendroides* (*Dronkgras* of the Colonists, from its apparently intoxicating effects upon cattle which feed upon it), *Festuca scabra*, &c., but I speak only of those parts of the country which I have actually visited.

The following list of the sequence of Orders according to their number in species is prepared from the collections already mentioned:—

COMPOSITE REGION (EASTERN PORTION).

	Per cent.
1. Compositæ	23·6
2. Gramineæ	8·
3. Leguminosæ	5·3
4. Liliaceæ	4·8
5. Scrophularineæ	3·9
6. Crassulaceæ	3·3
7. Asclepiadeæ	2·7
8. Geraniaceæ	2·5
9. Ficoideæ	2·4
10. Cyperaceæ	2·2
11. Irideæ	2·0
12. Amaryllideæ	1·9

It will at once be seen that the abundance of Compositæ is the most striking characteristic of the Region. Here also, the preponderance of individuals is immensely in excess of the numerical proportion of species.

As in the Karroo Region, Rutaceæ, Ericaceæ, Restiaceæ, are practically absent; Bruniaceæ, Penæaceæ, and Proteaceæ, absolutely so. In comparison with the Karroo Flora, Crassulaceae and Ficoideæ occupy a much lower position; while in this case again the reduced proportion of species by no means represents the paucity of individuals. Notwithstanding this circumstance the relations with the Karroo Region are considerable in identical genera and species; in a similar deficiency of Rubiaceæ, Acanthaceæ, Verbenaceæ and Aroidcæ; and it may hereafter be found desirable to treat the two Regions as sub-divisions of one.

With respect to the Tropical African Region and the South Western Region the differences are more marked, as will be seen by a comparison of the predominating Orders of each.

The naturalised plants of foreign origin call for little remark. Those from Europe are confined to a few wayside weeds, or weeds of cultivation. *Xanthium spinosum* is a troublesome pest; *Argemone Mexicana* and *Datura Metel* have established themselves near the Orange River. The *Opuntia Tuna* (?) so annoying in the Karroo Region, is here little seen, only a few individuals straggling up the warmer vallies of the mountains on the southern edge of the Region.

THE KALAHARI REGION.

This Region extends but a slight distance into the Colony, and since our knowledge of its Flora excepting the eastern part, is still comparatively small, I shall make but few remarks concerning it. Grisebach (loc. cit.) has carefully collected all that was known up to 1872, and the reader is referred to his pages for more details than can be given here.

The northern boundary begins on the coast at about 18° S. lat., thence runs nearly due east, until it reaches about 30° of east

longitude, when it turns south to the Orange River, crosses this near Hope Town, runs westwardly along the river and south of it conterminously with the boundary of our Composite Region, until it reaches the neighbourhood of the Kabiskouw Mountain; thence northerly along the east side of the Namaqualand mountains to the Orange River. Where it touches the coast again is unknown. It thus includes Great Namaqualand, Damaraland, Ovampoland, Bechunaland, and great part, if not the whole, of the Transvaal, and the Free State.

The surface of the country is mostly very sandy, and generally speaking surface water is everywhere very scarce, and springs infrequent. Nevertheless, when they do occur they are sometimes strong and copious, and there is every reason to believe that immense stores of underground water exist at no great depth over a large part of the Region.

The climate is not yet well known. The heat in summer is great, the nights cool, and even frosty in winter, and the rainfall which does not seem to be inconsiderable, is entirely one of summer thunderstorms. In the colonial Karroo the soil being baked, a large part of the rain runs off to the sea; here, on account of the sandy nature of the soil, the greater part is retained, and, in the case of heavy falls, goes to increase the underground stores. The coast strip from 16° S. down to the Orange River mouth, and bounded by the interior mountains, is even more dry and rainless than that of Little Namaqualand, and probably should be joined with the Karroo Region of the Colony.

The Kalahari is essentially a grass country interspersed with isolated shrubs or trees. Towards the northern boundary, which there corresponds with the southern limit of palms, these trees are grouped in dense forests. Further south the country is open. After the summer rains the grasses, which do not grow continuously like turf, but in tufts like stooling wheat, shoot up rapidly and acquire a height of three or four feet, sometimes even of five and six feet. East of the copper mines of Namaqualand they have frequently been cut by the natives, and brought in loads for sale as fodder. Species of Aristida (Twa-gras) are the most abundant, but there are others coarser, and some of spinous growth.

The trees appear to be chiefly Acaciæ of several species, of which *A. giraffae* (the *Kameel doorn*), is one of the most widely distributed; others are armed with formidable thorns. These occur also though sparingly, on the southern side of the Orange River; and from their existence, from the abundance of Twa grass, the presence of certain genera which do not occur further south and the absence of the composite shrubs, we may infer that this tract, known as Bushmanland, belongs to the Kalahari Region. The much controverted point as to whether the Orange River forms the floral

boundary of the Colony, may now be regarded as decided in the negative.* The Olive of the Colony (*Olea verrucosa*), also occurs here, and a number of smaller shrubs as Capparis, Zizyphus, Grewia, Rhus, Tarchonanthus, Vangueria, Euclea, Royena, Lycium, &c. The Mesembryanthemums of the Cape, and other succulent Ficoideæ, as also Crassulaceæ, appear to be very scarce, though not entirely absent. A species of Atriplex is regarded as valuable for stock in Bechuanaland. As very little is generally known respecting the plants found in this Region, I will give the following list of genera mentioned by Burchell, who travelled beyond Litakun, collected by Dr. Muskett near Hope Town, or found by myself near Kimberley and Barkly, in the south-eastern part of the Region: Clematis, Cissampelos, Sisymbrium, Heliophila, Senebiera, Lepidium, Cleome, Cadaba, Capparis, Oligomeris, Polygala, Anacampseros, Talinum, Sida, Sphæralcea, Hibiscus, Melhania, Hermannia, Maherina, Grewia, Corchorus, Triaspis, Celastrus, Zizyphus, Aitonia, Rhus, Crotalaria, Argyrolobium, Psoralea, Indigofera, Bolusia, Sesbania, Vigna, Cassia, Bauhinia, Elephantorrhiza, Vahlia, Cotyledon, Myriophyllum, Terminalia, Combretum, Mesembryanthemum, Tetragonia, Aizoon, Pharnaceum, Vangueria, Vernonia, Pteronia, Nidorella, Nolletia, Chrysocoma, Tarchonanthus, Helichrysum, Geigeria, Pentzia, Senecio, Othonnopsis, Osteospermum, Wahlenbergia, Lobelia, Royena, Euclea, Menodora, Olea, Raphionacme, Pachypodnim, Gomphocarpus, Dæmia, Barrowia, Ceropegia, Sebæa, Chironia, Trichodesma, Heliotropium, Lithospermum, Ipomæa, Convolvulus, Evolvulus, Falkia, Solanum, Lycium, Aptosimum, Peliostomum, Nemesia, Rhigozum, Pterodiscus, Harpagophytum, Sesamum, Barleria, Justicia, Bouchea, Ocimum, Salvia, Stachys, Leucas, Boerhaavia, Celosia, Hermbstaedtia, Sericocoma, Atriplex, Salsola, Oxygonum, Arthrosolen, Loranthus, Euphorbia, Croton, Ficus, Salix, Lanaria, Cyanella, Babiana, Gladiolus, Crinum, Brunsvigia, Buphane, Asparagus, Aloe, Bulbine, Eriospermum, Anthericum, Tulbaghia, Dipcadi, Ornithogalum, Cyperus, Andropogon, Anthistiria, Aristida.

On the west coast near Walwich Bay is the very remarkable *Welwitschia mirabilis*, (Tumboa) of the Order Gnetaceæ; and the singular Cucurbit, *Acanthosicyos horrida*, the fruit of which is used by the natives.

Towards the eastern edge of the Region, including part of the Transvaal, and the Free State the Flora passes gradually over to that of the Tropical African Region, and is especially rich in tropical types in the neighbourhood of the well-known Magaliesbergen.

* On this point I am indebted for valuable information to Mr. E. J. Dunn, and also to Dr. E. B. Muskett of Hope Town, who first pointed out to me that the statements on this subject of Burchell, usually so accurate, were mistaken.

The collections in the Transvaal have been considerable, but I do not treat of them here chiefly because of their intermediate character.

European Plants in the Cape Colony.

The following remarks on the European plants found in the Cape Colony apply to all those parts of the several Regions I have visited; but not to Kaffraria and Natal, which I do not know, except from the reports of others. I have already referred to the fact that such plants are seldom found at any considerable distance from human habitations, or from waysides. One may walk for a whole day over mountain-sides, or even plains, and scarcely see a European plant. On Table Mountain, which, as everyone knows, is close to Cape Town, the resort of Europeans for 200 years past, if the observer leaves the low vallies, where, up to 500 feet, the common species I have named above on page 296 may be found* together with such plants as *Verbena officinalis*, *Verbascum virgatum*, *Phytolacca decandra*, *Sanicula Europaea*, *Hypochaeris glabra*, *Anagallis arvensis*, &c., he will find little or nothing beyond. In fact I can remember no plant at an elevation of 1,000 feet except *Bartsia Trixago*, and even that is by no means frequent. It is almost the same on the plains when one has left houses and roads a few miles away. By some watercourse or stream, *Epilobium hirsutum*, *Lythrum hyssopifolium*, *Cotula coronopifolia*, or some other water-loving plants may be met with, but little else. Nor is the case different in other parts of the Colony and on the higher mountains. On the highest parts of Compassberg (8,500 feet ?) and on the Winterhoeksberg (6,500 feet) I did not find a single European species, or indeed any foreign species. It is true the situation was there unfavourable for many plants, being steep, rocky and sometimes dry. Yet the first named has summer thunderstorms and winter snows, and the latter regular winter rain and snow, and it might have been expected that some hardy alpine species could here have found a lodgment. On the lower mountains of the Eastern Region may be found *Thalictrum minus*, *Agrimonia Eupatoria*, *Bartsia Trixago*; I can recollect no others. On the Sneeuwberg mountains the first-named and *Blitum virgatum*.

These facts seem to show that the arrival of the majority of the introduced foreign plants in South Africa is of comparatively recent date; of the great bulk of them probably contemporaneous with that of civilized man.

The subject of European genera found within the Colony is a much wider one; but I am unable to enter upon it here.

* I have there omitted *Erigeron Canadense*, a common wayside weed.

Summary.

Speaking generally, and disregarding exceptions, the Flora of the Regions of South Africa is distinguished :—

1. By its highly differentiated character.
2. By its want of luxuriance of growth (but from this the Tropical Region must be excepted).
3. By the narrow distribution area of each species.
4. By the deficiency of trees.
5. By the paucity of sociable plants.
6. By its power to resist the aggression of foreign invaders.

STATISTICS—POPULATION, REVENUE, COMMERCE, AND CUSTOMS TARIFF.

The statistics of the Cape Colony are not as complete in some respects as could be desired. Since the census of 1875, there has been no official enumeration of the population, agricultural industries, or pastoral productions. But with regard to Revenue and Expenditure, the public Assets and Liabilities, and the Trade transactions of the Colony, the returns available are most full and accurate, as will be seen from the appended tables.

A computation has been made of the area and population of the Colony, including Griqualand West, the Transkeian Territories and Griqualand East, and the results give a total area of 213,636·1 square miles and a population of 1,252,347 persons, of whom 340,000 are European or white, and the remainder coloured or native races.

From the other statistics at our disposal, we present the following information as to the actual condition of the Colony, in a brief and succinct form:—

Public Revenue (1884-85):—

From taxation	£1,650,841	
For services rendered	1,351,799	
Income from Colonial estates ..	236,636	
Fines, forfeitures, interest, &c. ..	78,876	
		£3,318,152
Public expenditure (1884-5)		.. £3,375,682
Government Public Debt		.. £20,417,227
Corporate Bodies Debt		.. £1,254,935
Valuation of fixed Property for rateable purposes		.. £37,799,508
Area of Crown Lands undisposed of		.. 45,298,808 acres
Extent of Railways opened		.. 1,599 miles
Do. Telegraph Lines		.. 8,663 miles of wire
Roads, Main and Divisional		.. 8,400 miles
Number of Vines in the Colony		.. 70,000,000 vines
Diamonds, production of (1884-5)		.. 2,282,433½ carats
Do. declared value exported		.. £2,553,671
Wool exported 1885, quantity		.. 34,432,562 lbs.
Do. declared value		.. £1,426,108
Mohair exported 1885, quantity		.. 5,251,301 lbs.
Do. value		.. £204,018
Ostrich feathers exported 1885		.. 251,084 lbs.
Do. value		.. £585,278
Copper ore, exported 1885		.. 20,213 tons
Do. value		.. £395,675
Hides, ox and cow, exported 1885 (number of)		.. 290,010
Do. value		.. £128,915
Skins (goat and sheep) exported 1885, number of		.. 3,827,336
Do. value of		.. £295,840
Tonnage of British vessels entered and cleared 1885 ..		5,106,328 tons
Do. of Foreign vessels		.. 275,789 tons

The commercial transactions of the Colony are shewn in detail in the accompanying Customs Trade Returns (Tables A and B), giving the quantity or value of the articles imported and entered

for consumption as well as the quantity and value of the articles of export. But to illustrate how materially these trade operations add to the commerce of Great Britain, we present a return of the aggregate value of the imports and exports for the period from 1880 to 1885:—

	£
Exports, total value of, from 1880-85	45,852,234
Imports, total value of, from 1880-85	44,473,151
Total value of Imports and Exports, 1880-85..	90,325,385
Imports from the United Kingdom, 1880-85	34,336,687
Do. from British Possessions do.	5,696,352
Do. from Foreign Countries do.	3,444,112
Exports to the United Kingdom, 1880-85	43,292,750
Do. to British Possessions do.	821,110
Do. to Foreign Countries do.	1,738,374

The sources of Colonial Revenue are customs duty, excise duty, transfer duty, auction duty, succession duty, bank note duty, house duty, and stamps, licences, and office fees. Besides these, there are receipts from railways, telegraphs, post offices, lands and mines, forests, native hut-tax, tolls on bridges, &c.

Although the Revenue for the last year shows a decline in sympathy with the prevailing general depression and shrinkage of business, the annexed comparative statement (prepared by the Hon. C. Abercrombie Smith, Controller and Auditor-General) of the ordinary revenue and expenditure from 1870 to 1885 (*vide* table E) demonstrates the remarkable financial prosperity which the Colony enjoyed during the greater part of that period. Beginning on the 1st January, 1870, with a balance deficit of over a million sterling, the excess of revenue over expenditure for a continuous number of years was such as to clear off the deficit, and leave a surplus of over half a million on the 30th June, 1885.

The table C exhibits the various purposes to which the public Revenue has been applied from 1867 to 1885. In the Expenditure for the nine financial years, chargeable to ordinary revenue, it will be seen that £1,143,930 was disbursed for Native Affairs, including the education of natives, and £1,782,604 for internal Defence.

The table D shows the various services for which the loans now constituting the public debt have been raised and appropriated, namely, railways, harbours, bridges, buildings, telegraphs, irrigation works, immigration, and suppression of native rebellion.

With the exception of the last item—expenditure for native rebellion, chiefly in Basutoland, nearly the whole of the public debt of the Colony has been incurred on works, either of a directly reproductive and remunerative character or of permanent improvement, many of which are now contributing to a large extent towards the payment of interest, and most of them in course of time will become income-producing investments.

E.—Comparative Statement of the Revenue and Expenditure (Ordinary), of the Colony of the Cape of Good Hope, 1870-85.

	Revenue.	Expenditure.	Surpluses.	Deficits	Balance Surplus.	Balance Deficit.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Balance (deficit), 1st January, 1870	...	1,054,913 13 7	...	1,054,913 13 7	...	1,054,913 13 7
Calendar Year 1870	711,364 0 1	653,360 0 0	58,004 0 1	...	...	996,909 13 6
,, ,, ... 1871	734,662 13 7	613,073 18 1	121,588 15 6	...	...	875,320 16 0
,, ,, ... 1872	1,040,240 15 0	632,564 17 8	407,675 17 4	...	...	467,645 0 8
,, ,, ... 1873	1,215,061 4 11	804,758 0 4	410,303 4 7	...	...	57,341 16 1
,, ,, ... 1874	1,518,558 1 1	903,210 13 10	615,347 7 3	...	558,005 11 2	...
,, ,, ... 1875	1,672,720 19 9	1,105,486 14 4	567,234 5 5	...	1,125,239 16 7	...
Period, January—June, 1876	831,083 10 0	901,575 6 6	...	70,491 16 6	1,054,748 0 1	...
Financial Year 1876-77	1,323,207 11 3	1,601,610 14 2	...	278,403 2 11	776,344 17 2	...
,, ,, ... 1877-78	1,588,010 3 2	1,691,932 15 5	...	103,922 12 3	672,422 4 11	...
,, ,, ... 1878-79	2,083,818 14 3	1,916,081 4 11	167,737 9 4	...	840,159 14 3	...
,, ,, ... 1879-80	2,536,907 16 2	2,257,075 2 5	279,832 13 9	...	1,119,992 8 0	...
,, ,, ... 1880-81	2,999,903 0 4	2,806,022 14 9	193,880 5 7	...	1,313,872 13 7	...
,, ,, ... 1881-82	3,525,472 0 3	3,278,785 5 3	246,686 15 0	...	1,560,559 8 7	...
,, ,, ... 1882-83	3,306,537 12 0	3,686,288 0 9	...	379,750 8 9	1,180,808 19 10	...
,, ,, ... 1883-84	2,953,528 17 4	3,502,487 12 11	...	548,958 15 7	631,850 4 3	...
,, ,, ... 1884-85	3,318,152 6 4	3,375,682 1 6	...	57,529 15 2	574,320 9 1	...

Balance deficit, 1st January, 1870	£1,054,913 13 7
,, surplus, 30th June, 1885	574,320 9 1
Excess of Revenue over Expenditure from 1st January, 1870, to June 30th, 1885	£1,629,234 2 8

DETAILS OF REVENUE.

HEADS OF REVENUE.	REVENUE (ACTUAL) IN DETAIL FOR								
	1876-77.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-4.	1884-5.
	£	£	£	£	£	£	£	£	£
Customs (including Harbour Dues)	605981	775776	923597	983456	1198054	1356947	1119752	906499	1082213
Land Sales ..	63330	50913	46081	78772	77385	68329	49710	35086	18930
Land Revenue ..	114108	90325	108466	178419	161134	180139	193422	200587	192639
Rent (exclusive of Land)	2503	2716	3855	8169	19616	32116	23529	20214	18795
Transfer Dues...	77368	72082	86703	98936	129063	146604	123442	99967	93798
Auction Dues ...	20999	19652	26960	24733	32503	34617	31284	21078	18296
Succession Dues	6193	7222	7565	8456	7658	11352	12531	11637	12999
Taxes, House Duty	18	8	58428	86457	70331	75916	87535	89358	90001
Stamps and Stamped Licences	97846	99981	118872	138121	178952	213434	133397 86066	112109 102014	125868 124280
Bank Notes Duty	8136	6957	8388	9306	13682	18732	15740	11067	9980
Postage	60306	61482	70542	77631	92089	109887	106530	114619	128575
Excise Duty .	...	...	63522	74104	49566	58293	43103	19468½	94686
Fines, Forfeitures, & Fees of Court	17894	15673	15113	15165	18567	24792	24951	21573	16942
Fees of Office ...	8078	5991		3297	6745	10562	6600	6409	5149
Sales of Government Property	3165	2744	11943	1458	1700	2727	1272	931	796
Reimbursements	18011	36101	58107	110347	90949	90015	92865	102409	110745
Mines	...	...	..	...	18760	22919	26036	37629	24271
Miscellaneous Receipts ...	163	5569	3237	1205	3262	5736	6606	11175	28886
Interest & Premiums	4497	3016	21851	20050	15174	4773	9330	26140	22037
Special Receipts	2369	2368	3091	13815	20148	26888	117419	29106	18094
Railway Receipts	186439	274545	396162	564532	739206	966856	941509	920066	1027030
Telegraph Receipts	20937	23419	29633	35837	54741	63224	52271	50809½	52301
Revenue from Transkein Territories ...	...	29763	20773	Included above		...	...	...	...
Stores issued ...	4866	1707	929	1551	617	613	1638	3578	841
Total ...	1323207	1588010	2083818	2536908	2999903	3525472	3306538	2953529	3318152

IMPORTS AND EXPORTS.

RETURN of the Total Imports and Exports of the Colony, and the Value of Imports from and Exports to the United Kingdom, British Possessions and Foreign Countries during each of the last Six Years.

PARTICULARS.	1880.	1881.	1882.	1883.	1884.	1885.
	£	£	£	£	£	£
Imports	8,092,043	9,787,140	9,660,641	6,680,942	5,260,697	4,991,688
Exports	7,858,046	8,600,310	8,561,458	7,576,415	7,031,744	6,224,261
Imports and Exports ...	15,950,089	18,387,450	18,222,099	14,257,357	12,292,441	11,215,949
United Kingdom.						
Imports from ...	6,183,309	7,739,224	7,613,396	4,899,402	4,023,819	3,877,537
Exports to	7,478,821	8,092,820	8,113,936	7,142,330	6,602,193	5,862,650
British Possessions.						
Imports from ...	1,118,181	1,036,430	1,074,301	1,051,862	736,618	678,960
Exports to	89,701	326,062	131,409	100,272	90,580	83,086
Foreign Countries.						
Imports from ...	790,553	1,011,486	972,944	729,678	500,260	435,191
Exports to	289,524	181,428	316,113	333,813	338,971	278,525

NOTE.—Specie included in above Returns.

RETURN of the Total Number and Tonnage of British and Foreign Shipping entered and cleared during each of the last six years.

PARTICULARS.		1880.	1881.	1882.	1883.	1884.	1885.
INWARDS:							
British							
	No. ...	1,785	1,874	1,935	1,853	1,698	1 711
	Tons. ...	2,123,091	2,327,877	2,858,906	2,832,833	2,517,707	2,560,419
Foreign							
	No. ...	329	438	393	282	225	297
	Tons. ...	133,314	213,113	199,970	157,444	133,299	154,639
Total							
	No. ...	2,114	2,312	2,328	2,135	1,923	2,008
	Tons. ...	2,256,405	2,540,910	3,058,876	2,990,277	2,651,006	2,715,058
OUTWARD:							
British							
	No. ...	1,784	1,854	1,942	1,829	1,720	1,703
	Tons. ...	2,093,663	2,334,767	2,837,636	2,808,690	2,528,621	2,544,615
Foreign							
	No. ...	319	406	389	286	235	293
	Tons. ...	127,250	191,824	196,379	160,568	142,490	153,182
Total							
	No. ...	2,103	2,260	2,331	2,115	1,955	1,996
	Tons. ...	2,220,913	2,526,591	3,034,015	2,969,258	2,671,111	2,697,797

F. W. BURROWS,
Collector.

IMMIGRATION.

RETURN of the Number of Immigrants introduced into the Colony from Europe through the Agency of the Government from the date of the establishment of the London Emigration Office.

YEAR.	Ordinary or Government.			Aided.			Total Souls.		Grand Total Souls.
	Men.	Women.	Children.	Men.	Women.	Children.	Ordinary.	Aided.	Ordinary and Aided
August, 1873 to December 31st, '73	377	54	75	4	...	...	506	4	510
1874.	776	20	20	92	35	46	816	173	989
1875.	1283	33	28	202	105	140	1344	447	1791
1876.	1312	93	156	307	190	214	1561	711	2272
1877.	927	105	290	425	253	212	1322	890	2212
1878.	...	...	not	given	...	...	467	289	756
1879.	314	49	112	415	231	216	470	862	1332
1880.	...	...	not	given	...	...	1205	1402	2607
1881.	...	...	not	given	...	...	1550	2613	4163
1882.	...	...	not	given	...	...	1246	3399	4645
1883.	...	...	not	given	...	...	361	1029	1390
1884.	...	...	...	72	117	103	...	292	292
							10848	12111	22959
German Agriculturists. 1883.	83	75	220	...	...	...	378	...	378
									23337

Note.—Ordinary or Government Immigrants consisted of Agriculturists settled under the Regulations; skilled labourers for Railway and other Public Works; and Recruits for the Cape Mounted Rifles and Cape Infantry Regiments.

Aided Immigrants comprised the class of Domestic Servants, Artizans, &c., introduced by Employers in the Colony.

PARTICULARS.		1880.	1881.	1882.	1883.	1884.	1885, first 6 months.
Titles issued ...	No.	1,087	859	1,000	1,828	2,070	549
Extent alienated	acres	2,976,438(*b*)	3,136,267(*b*)	2,790,450(*b*)	2,462,193(*b*)	2,309,166(*b*)	904,046(*b*)
Purchase amount paid	£	68,206	63,707	49,811	51,686	37,759	4,899
Annual quitrent payable ...	£	13,206	11,537	10,448	15,202	23,785	5,653
Area of the Colony (*a*) ...	acres	131,711,600	131,711,600	131,711,600	131,711,600	131,711,600	131,711,600
Area disposed of	acres	74,810,670	77,946,937	80,737,387	83,199,580	85,508,746	86,412,792
Area undisposed of	acres	56,900,930	53,764,663	50,974,213	48,512,020	46,202,854	45,298,808

(*a*). Inclusive of East and West Griqualand, exclusive of Tembuland and Transkei.
(*b*). Exclusive of Tembuland and Transkei.

A. DE SMIDT, Surveyor-General.

VALUATION OF PROPERTY FOR DIVISIONAL COUNCIL PURPOSES.

Divisions.	Date.	Amount.	Divisions.	Date.	Amount.
		£			£
Cape	1883	4,979,352	Riversdale ..	1885	402,948
Port Elizabeth ..	1881	1,950,516	Aliwal North ..	1880	396,533
Kimberley ..	1882	1,711,751	Herbert	1885	371,919
Victoria West ..	1881	1,200,861	Mossel Bay ..	1885	369,181
Cradock	1885	1,090,040	Calvinia	1880	362,533
Oudtshoorn ..	1885	1,067,390	Tulbagh	1885	357,565
Paarl	1885	1,038,027	Murraysburg ..	1885	349,212
Albany	1883	993,948	Wodehouse ..	1882	340,000
Richmond.. ..	1881	859,057	Aberdeen ..	1882	323,367
Albert	1881	840,000	Fort Beaufort ..	1885	300,436
Fraserberg ..	1885	831,328	Hay	1883	302,850
Graaff-Reinet ..	1885	827,944	Hanover	1881	295,284
Queen's Town ..	1881	822,699	Barkly West ..	1881	295,076
King Wm's. Town	1883	795,496	Humansdorp ..	1885	282,263
Beaufort West ..	1885	783,966	Barkly East ..	1881	272,214
Somerset	1884	747,613	Clanwilliam ..	1880	263,888
Colesberg	1880	714,311	Jansenville ..	1884	261,289
Uitenhage ..	1884	704,248	George	1885	260,645
Robertson.. ..	1880	699,316	Ladismith ..	1881	232,651
Malmesbury ..	1884	670,664	Piquetberg ..	1883	221,657
Swellendam ..	1881	606,842	Uniondale ..	1881	212,627
Caledon	1880	587,262	Bredasdorp ..	1885	206,000
Middleburg ..	1884	580,754	Alexandria ..	1885	181,067
Worcester ..	1884	573,285	Cathcart	1881	180,606
Hope Town ..	1884	544,539	Knysna	1885	171,957
Prince Albert ..	1885	527,055	Stockenstroom ..	1883	161,414
Carnarvon ..	1882	502,122	Bathurst	1880	158,468
Stellenbosch ..	1882	485,694	Namaqualand ..	1881	154,307
Bedford ..	1884	453,643	Victoria East ..	1884	144,208
Willowmore ..	1881	444,446	Stutterheim ..	1882	142,681
Tarka	1881	427,752	Peddie	1884	123,235
Herschell No. D. C.			Komgha	1883	112,927
East London ..	1881	416,354	Simon's Town ..	1883	110,225
			Total ..		37,799,508

x 2

CAPE COLONY TARIFF OF CUSTOMS DUTIES.

	£	s.	d.
Agricultural Implements, for every £100 value (1)	10	0	0
Ale and Beer, the gallon	0	1	3
Bags for Flour, Grain, Coal and Wool, for every £100 value	10	0	0
Boots and Shoes, viz :			
Men's the dozen pairs	0	8	0
Women's do.	0	6	0
Boys' and Girls' do.	0	3	0
Children's do.	0	2	0
Slippers and Goloshes do.	0	2	0
and for every £100 value	10	0	0
Butter, including Butterine or any other substance imported for mixing with, or for use as Butter, the 100 lb.	0	12	6
Candles, the lb.	0	0	3
Carriages, Carts, Waggons, and other wheeled vehicles, including wheelbarrows, for every £100 value (2)	20	0	0
Axles, Springs and Lamps for Carts and Carriages, for every £100 value	10	0	0
Cartridges, for every £100 full value	15	0	0
and for every lb. of Gunpowder therein	0	0	6
Cement, per 400 lbs.	0	1	6
Cheese, the 100 lb.	0	16	8
Chicory do.	0	16	8
Cider, the gallon	0	0	6
Cinnamon or Cassia, the lb.	0	0	3
Cloves, the lb.	0	0	3
Coals, Coke, and Patent Fuel, the ton of 2,000 lbs.	0	1	0
Cocoa and Chocolate, the 100 lbs.	0	16	8
Coffee, the 100 lbs.	0	16	8
Confectionery: Jams, Jellies, and Manufactured Sweets, not being medicated or properly classed as Apothecaryware, but including Sweetmeats of all sorts, and other articles with which sugar is largely compounded for preserving purposes (3), the 100 lbs. ..	0	16	8
Corks and Bungs, for every £100 value	10	0	0
Corn and Grain, viz. :			
Barley, the 100 lbs.	0	1	0
Maize do.	0	1	0
Oats do.	0	1	0
Rye do.	0	1	0
Wheat do.	0	1	0
Dates	0	4	2
Dynamite, Blasting Powder, Blasting Compound, Gun Cotton, and Fuse, the lb.	0	0	6
Flour, Wheaten and Wheaten Meal, the 100 lbs.	0	3	6
Fruits, Dried : Currants, Raisins, and Figs, the 100 lbs.	0	12	6
Other Sorts do.	0	12	6
Ginger, Dry, the lb.	0	0	3
Preserved Chow Chow and other similar Preserves, the lb.	0	0	4
Gunpowder, the lb.	0	0	6
Guns or Gun Barrels, the barrel	1	0	0
Hops, for every £100 value	10	0	0
Iron, Bar, Bolt and Rod, for every £100 value	10	0	0
Iron Wire } for fencing, for every £100 value	10	0	0
Steel Wire }			
Lard, the 100 lbs.	0	12	6
Mace, the lb.	0	0	3
Malt, for every £100 value	10	0	0

	£	s.	d.
Marble, for every £100 value	10	0	0
Matches: viz.:			
Wooden, in boxes or other packages containing not more than 100 matches, the gross	0	4	0
In boxes or other packages containing more than 100 and not more than 200 matches, the gross	0	8	0
(And at the same rate for larger boxes)			
Wax Vestas and Fusees in boxes or other packages, containing up to 50 Vestas or Fusees, the gross	0	4	0
In boxes or other packages containing up to 100 Vestas or Fusees, the gross	0	8	0
(And at the same rate for every additional 50 Vestas or Fusees)			
Meat, Salted or Cured, and not in cases hermetically sealed, the 100 lbs.	0	8	4
Metal Composition and Sheathing, for every £100 value	10	0	0
Mules, each	1	0	0
Nutmegs, the lb..	0	0	3
Nuts, all kinds, excepting Cocoa Nuts, the 100 lbs. (4)	0	8	4
Oils, of all descriptions, including Mineral, imported in vessels containing not less than one Imperial Pint (Chemical, Essential, Perfumed, and Castor Oils, and Fish Oils in the raw state, the produce of Africa excepted), the Imperial gallon (5)	0	1	0
Paddy, the 100 lbs.	0	-	6
Pepper, the lb.	0	0	3
Pictures and Engravings, and Frames for same, for every £100 value (6)	15	0	0
Pimento, the lb.	0	0	3
Pistols or Pistol Barrels, each..	0	10	0
Rattans, for every £100 value	15	0	0
Rice, the 100 lbs. (7)	0	4	2
Rosin, for every £100 value	10	0	0
Salt, in Bulk or in Bags, or other packages of not less than 100 lb., the 100 lb. (8)	0	0	3
Soap, Common, Brown, Blue, Yellow, or Mottled, not perfumed, the 100 lbs. (9)	0	4	2
Soda Caustic, for every £100 value	10	0	0
Spirits or Strong Waters of all sorts, not sweetened, mixed, or perfumed, and not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength of proof, imported in bottles, each of not greater content than six to the Imperial gallon, per dozen bottles	1	1	0
Spirits or Strong Waters, of all sorts, not sweetened, mixed, or perfumed, and not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength of proof, imported in bottles each of not greater content than twelve to the Imperial gallon, per dozen bottles	0	10	6
Spirits or Strong Waters, in bottles of greater capacity or content than the above, per Imperial gallon	0	10	0
Spirits or Strong Waters, not in bottles, per Imperial gallon	0	10	0
Spirits, sweetened or mixed, so that the degree of strength cannot be ascertained, imported in bottles, each of not greater content than six to the Imperial gallon, per dozen bottles (10)	1	4	0
Spirits, do. do., imported in bottles, each of not greater content than twelve to the Imperial gallon, per dozen bottles	0	12	0
Spirits do., do., not in bottle, the Imperial gallon	0	12	0
Spirits, Perfumed, the Imperial gallon (1)	0	15	0
Sugar, Refined or Candy, the 100 lbs.	0	8	4
Unrefined, do. (12)	0	8	4
Molasses, do.	0	8	4
Staves, for every £100 value (13)	10	0	0
Tallow, the 100 lbs.	0	4	2
Tamarinds, do	0	8	4

	£	s.	d.
Tea, per lb.	0	0	8
Tin, viz.:—Plate or sheet, for every £100 value	10	0	0
Tobacco, not Manufactured, the lb. (14) Manufactured	0	1	0
(not Cigars, or Snuff), the lb.	0	2	0
Cigars, the lb.	0	4	0
And for every £100 value	10	0	0
Cigarettes, the lb. (gross)	0	3	0
Snuff, the lb.	0	4	0
Turmeric, the lb.	0	0	3
Turpentine, the gallon	0	1	0
Varnish, ,,	0	3	0
Vinegar, ,,	0	0	6
Wine, in bottles each of not greater content than six to the Imperial gallon, per dozen bottles	0	12	0
In bottles each of not greater content than twelve to the Imperial gallon, per dozen bottles	0	6	0
In other bottles, or in wood, the Imperial gallon	0	5	0
Wood, Unmanufactured, other than Teak, the cubic foot (15)	0	0	2
Wood, other than Teak, planed or grooved, the cubic foot	0	0	3
Teak, the cubic foot	0	0	4
Goods not being enumerated or described, nor otherwise charged with Duty, and not prohibited to be imported or used in the Colony of the Cape of Good Hope, for every £100 value	15	0	0

FREE.

Animals, Living, excepting Mules.
Anchors and Chain Cables for ships' use.
Bottles of Common Glass, imported full of Wine, Beer, or other liquid liable to Customs Duty. (16)
Books, printed, not being Foreign Reprints of British Copyright Works. (17)
Bullion or Coin.
Cotton in its raw state.
Creosote.
Diamonds or other Gems in their rough state.
Feathers, Ostrich, undressed.
Fish.*
Flowers of Sulphur. (18)
Fruit, green—including Cocoanuts. (19)
Guano and other Manures.
Hair, viz.: Angora.*
Hides, viz.: Ox and Cow.*
Horns, viz.: Ox and Cow.*
Wild Animals.*
Ice.
Ivory.*
Machinery, viz.: Agricultural, Mining and Sawing. (20)
Maps and Charts.
Photographs.
Printed Music.
Oil, Fish, in a raw state.
Ore, Copper and other.*
Paper for Printing purposes.
Printers' and Bookbinders' Materials.
Provisions or other Stores for H.M.'s Land and Sea Forces, when the Customs Duties shall not have been paid thereon.
Railway Materials. (21)
Seeds, Bulbs or Plants (Garden). (22)
Sheep Dip.

*Being the growth and produce of Africa, and not manufactured, but in the raw state.

Skins, viz.: Goat.*
Seal.*
Sheep.*
Wild Animals.*

Specimens Illustrative of Natural History.

Telegraph Materials.

Wine imported or taken out of Bond for the use of military officers serving on full pay in this Colony, and also for the use of officers of Her Majesty's Navy serving on board any of Her Majesty's ships, subject, however to such regulations, as the Governor shall think fit to make: and, provided, that if any such wine shall be subsequently sold in this Colony, except for the use or consumption of any of Her Majesty's military or naval officers serving as aforesaid, the same shall be forfeited and be liable to seizure accordingly. (23)

Wool, viz., Sheep's.*

All Articles of Military, Naval, or Volunteer Uniforms or Appointments imported by Imperial and Colonial Officers stationed in this Colony for their own use.

Maize and other Farm Produce, the growth of St. John's River Territory.

The following explanations shew in what way some of the terms in the tariff are interpreted in the Customs and Audit Offices. The items in the tariff to which the explanations refer are numbered ( ) and the corresponding explanations have the same numbers prefixed.

(1.) Includes ploughs, spades, hoes, sickles, scythes, rakes, harrows, &c.
(2.) Includes bicycles, tricycles and perambulators, but not toys.
(3.) On fruits preserved in their own juice without or with a very small proportion of sugar, a duty of 15 per cent. *ad valorem* is chargeable.
(4.) Includes shelled almonds and ground nuts.
(5.) If oil is imported in vessels of less than one Imperial pint, duty at the rate of 15 per cent. *ad valorem* is chargeable. Fish oil in a raw state *appears* to be exempt from duty, only when it is the produce of Africa.
(6.) Includes every description, except photographs, which are free.
(7.) Rice mixed with paddy is taken to consist of two-thirds rice and one-third paddy.
(8.) On salt in packages of less than 100 lbs. each, duty at the rate of 15 per cent. *ad valorem* is chargeable.
(9.) Includes soft soap. Perfumed soap is chargeable with the duty of 15 per cent. *ad valorem*.
(10.) Spirits, sweetened or mixed, include ginger brandy, punch, old tom, absinthe, kummel, bitters, cordials, liqueurs, &c.
(11.) Includes Eau de Cologne, Florida water, toilet vinegar, lavender water, &c.
(12.) Does not include glucose and saccharum, which are chargeable with the duty of 15 per cent. *ad valorem* (Treasury Letter, 26th September, 1884.)
(13.) Whether manufactured or unmanufactured, but not to include shooks, *i.e.*, casks not made up, but in bundles, composed of side and head staves and hoops. Head staves made into heads are liable to duty (Government Authority, 20th August, 1875.)
(14.) Tobacco, unmanufactured, includes Boer tobacco in the roll.
(15.) Wood unmanufactured, includes deals, logs, and any rough wood, not tongued and grooved, such as planks, and flooring boards.
(16.) Bottles, if imported empty, are chargeable with the duty of 15 per cent. *ad valorem*.
(17.) Does not include printed stationery for the use of schools.
(18.) Does not include sulphur imported in the lump, or in sticks.
(19.) Includes pine apples, bananas, oranges, &c.
(20.) Does not include chaff-cutters and corn shellers.
(21.) Include rails, sleepers, fastenings, culvert tops, iron girders for bridges, locomotives, ballast trucks, goods wagons, and carriages for railways, or tramways.
(22.) Does not include bird, coriander, caraway seed, &c.

(23.) Naval Officers are not entitled to wine free of duty when on shore, except when stationed on full pay at the victualling yard, Simon's Town in which case they are to be treated as if serving on board ship. (Government Authority, 20th October, 1874.)

On articles entered to be forwarded overland to either the Orange Free State or the South African Republic, a rebate is granted, in accordance with the regulations under Government Notice No. 759 of 1884; but all goods entered for rebate mut be conveyed to their destination beyond the borders of the Colony through one of the inland ports appointed by the Governor's Proclamation, and the mode of conveyance shall be by railway as far as practicable.

Printed by W. A. Richards & Sons, Government Printers, Cape Town.

A.—CUSTOMS TRADE RETURNS.

(MERCHANDIZE)

1.—Return of the Quantity or Value of the principal Articles Imported.

ARTICLES.		1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
Agricultural Implements	.. value £	9,908	11,341	32,430	57,756	34,34[illegible]	29,284	17,618	20,769	30,346
Ale and Beer	.. .. galls.	479,356	348,632	617,711	1,059,453	1,226,715	1,231,748	933,902	472,535	516,990
Apparel and Slops	.. .. value £	148,929	116,571	304,978	456,058	593,579	633,136	289,564	268,414	269,195
Bags all sorts	.. .. ..	47,460	32,359	48,878	65,738	56,111	63,700	65,770	47,138	47,511
Butter	.. .. .. lbs.	183,641	161,567	485,344	1,039,017	1,494,584	1,087,196	1,424,282	953,299	1,083,553
Candles	.. .. ..	311,773	694,847	1,153,705	1,756,464	2,293,047	1,981,759	1,666,182	1,085,316	2,077,743
Cheese	.. .. ..	268,860	318,129	925,755	1,124,809	1,230,394	1,326,894	1,099,266	1,012,430	878,266
Chicory	.. .. ..	230,160	528,200	770,557	883,589	1,060,416	620,803	798,872	775,650	911,453
Coffee	.. .. ..	3,035,312	7,[illegible]2,101	8,925,275	10,765,377	13,345,684	9,163,233	9,232,488	13,271,003	9,244,221
Confectionery	.. .. value £	10,464	11,868	33,544	2,398,843*	3,764,135	3,726,091	2,696,489	2,447,544	2,185,099
Corn, Grain and Meal:—										
	Barley .. lbs.	2,880	600	2,100	2,487,244	10,821,342	3,243,428	2,701,961	22,266	98,429
	Beans and Peas ..	4,800	300	276,389	387,879	568,889	476,580	643,658	506,991	373,032
	Bran	110,800	2,400	621,980	336,245	1,115,815	484,932	403,640	64,160	171,461
	Flour	11,650,828	1,777,603	12,288,265	19,458,043	31,844,187	20,562,867	33,047,024	25,831,667	14,961,833
	Maize	456,900	2,800	1,491,578	19,393,208	28,142,772	8,685,049	15,642,415	11,896,740	10,374,376
	Oats	746,880	Nil.	1,422,685	1,970,315	20,545,894	348,786	2,856,565	26,321	1,854,311
	Wheat	497,040	Nil.	13,076,398	39,508,385	41,742,622	56,948,928	49,801,330	43,046,362	52,391,796
Cotton Manufactures	.. .. value £	332,768	470,686	562,598	619,650	665,637	618,435	349,388	439,284	419,782
Gunpowder	.. .. .. lbs.	258,295	272,682	256,956	416,260	190,464	201,243	215,720	69,357	67,988
Guns	.. .. .. No.	2,346	3,841	20,961	2,815	8,762	4,365	4,589	2,682	2,100
Gun Barrels	.. ..	16	23	40	4	25	10	30	16	12
Haberdashery and Millinery	.. value £	264,257	249,884	574,221	714,727	812,631	808,626	472,826	531,579	527,221
Hardware, Cutlery and Ironmongery	..	107,634	126,166	283,532	552,798	704,825	665,005	337,920	255,099	191,888
Iron: Bar, Bolt and Rod	.. ..	11,352	12,783	43,407	31,518	34,087	34,879	16,021	7,722	10,803
Leather Manufactures	.. ..	81,258	96,435	286,567	396,977	482,452	498,340	286,572	282,183	237,623
Linen Manufactures	.. ..	22,482	23,251	58,844	48,827	61,480	58,032	26,422	18,418	23,111
Rice	.. .. lbs.	4,777,360	11,340,115	6,069,497	5,866,851	18,724,164	10,719,576	15,444,433	16,324,819	11,631,721
Saddlery and Harness	.. .. value £	19,944	19,829	63,635	129,891	141,868	98,918	30,939	22,916	21,441
Silk Manufactures	.. .. ..	4,796	4,426	20,492	14,958	11,166	10,949	4,295	4,682	4,339
Soap, viz.: Not Perfumed	.. lbs.	1,042,352	667,721	4,446,475	5,809,686	7,132,922	5,872,724	7,091,606	8,325,043	6,124,020
Spirits (all sorts)	.. .. galls.	63,573	86,341	163,956	228,643	320,032	294,095	195,120	215,442	177,713
Sugar: Unrefined	.. lbs.	10,940,496	15,446,984	21,638,715	31,767,055	34,110,804	41,665,558	30,932,915	29,941,102	25,459,667
Refined or Candy	.. ..	688,128	544,370	608,159	667,279	936,993	1,024,852	940,855	1,149,120	1,116,415
Molasses	.. ..	564,224	362,676	924,107	2,211,506	255,340	9,164	107,244	26,435	4,973
Tea	.. ..	388,450	809,186	768,447	1,638,895	1,632,500	1,136,463	1,145,713	1,295,042	1,140,260
Tobacco: Unmanufactured	.. ..	73,562	163,644	101,166	122,448	116,240	123,637	206,935	95,851	182,436
Manufactured	.. ..	24,055	125,291	450,258	366,677	403,818	368,554	386,382	229,710	145,541
Cigars	.. .. No.	1,531,400	3,005,250	4,649,196	895,123	724,750	223,900	280,150	..	..
Do.	.. .. lbs.	375	1,369	11,138	118,949	143,070	210,625	94,265	48,059	63,908
Wine	.. .. galls.	24,727	28,650	50,150	66,651	97,705	94,712	45,582	22,995	17,763
Wool, Unmanufactured	.. cub. ft.	289,068	402,568	1,161,582	1,356,973	2,413,168	1,996,338	1,276,487	677,754	1,008,368
Woollen Manufactures	.. .. value £	99,424	126,415	266,846	316,457	311,857	393,196	181,809	139,394	150,571

Customs House, Cape Town,
February, 1886.

*Ibs.

CUSTOMS TRADE RETURNS.

(MERCHANDIZE)

2.—Return of the Quantity or Value of the Principal Articles entered *for Consumption*.

ARTICLES.		1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
Agricultural Implements	.. value £	10,074	15,329	31,173	57,676	34,270	29,272	17,975	20,501	28,603
Ale and Beer	.. .. galls.	379,174	332,380	611,684	1,049,774	1,216,869	1,220,213	930,953	472,378	479,258
Apparel and Slops	.. .. value £	147,158	121,040	309,781	449,969	554,360	629,693	291,944	267,717	268,949
Bags, all sorts	.. .. ..	44,018	48,817	48,304	63,328	57,871	64,454	63,945	45,362	43,858
Butter	.. .. .. lbs.	190,056	148,942	491,367	1,055,388	1,483,486	1,121,991	1,380,566	946,809	1,069,276
Candles	.. .. ..	347,165	599,427	1,186,745	1,722,539	2,182,829	2,118,145	1,728,411	1,049,234	1,939,404
Cheese	.. .. ..	270,928	308,150	910,325	1,128,216	1,229,755	1,328,656	1,094,350	996,297	883,487
Chicory	.. .. ..	210,784	503,648	701,933	868,565	883,980	600,878	769,340	750,819	909,666
Coffee	.. .. ..	3,870,384	5,996,376	7,540,313	9,643,836	11,126,190	9,883,150	9,819,765	9,936,738	9,444,882
Confectionery	.. .. value £	18,448	11,877	33,974	2,614,155*	3,799,627	3,705,773	2,641,314	2,327,410	2,063,081
Corn, Grain, and Meal:—										
	Barley .. lbs.	2,880	600	2,100	2,487,244	9,853,151	4,066,066	2,642,025	36,378	98,429
	Beans and Peas ..	4,800	300	276,389	387,879	475,389	625,380	476,508	228,854	478,996
	Bran	110,800	2,400	700,709	367,043	1,115,812	484,932	402,160	64,160	171,461
	Flour	9,519,926	3,466,323	13,741,819	21,780,285	30,564,934	23,324,115	31,166,842	24,862,482	13,221,958
	Maize	456,900	2,000	1,490,578	18,977,175	27,862,931	9,283,016	15,563,230	12,168,176	10,854,242
	Oats	746,880	1,417	1,422,685	2,096,811	19,085,370	1,136,394	1,720,205	27,843	859,001
	Wheat	449,160	Nil.	13,725,961	39,703,225	41,742,622	56,947,944	49,979,431	41,443,980	54,990,180
Cotton Manufactures	.. .. value £	329,297	437,850	498,302	619,197	665,752	443,836	349,031	431,014	419,084
Gunpowder	.. .. lbs.	192,116	220,087	248,321	311,160	199,004	273,870	189,164	91,891	77,406
Guns	.. .. No.	2,721	4,019	23,531	2,795	4,998	4,437	4,402	3,150	1,957
Gun, Barrels	.. .. ..	10	73	40	4	25	10	30	16	12
Haberdashery and Millinery	.. value £	261,917	248,618	570,886	710,208	813,501	804,670	473,716	527,135	526,429
Hardware, Cutlery and Ironmongery	..	105,755	120,123	382,815	551,222	703,499	663,707	337,576	548,582	189,847
Iron, Bar, Bolt and Rod	.. ..	10,831	12,733	43,407	31,327	34,270	34,456	16,023	7,723	10,802
Leather Manufactures	.. ..	80,695	96,553	286,230	395,498	481,396	498,683	286,958	280,032	237,336
Linen Manufactures	.. ..	21,821	23,576	61,063	48,498	61,117	58,345	26,632	16,885	22,247
Rice	.. .. lbs.	6,023,808	5,069,225	7,947,338	9,461,156	13,760,704	13,463,911	12,768,004	10,010,488	10,683,681
Saddlery and Harness	.. .. value £	19,490	18,937	63,334	128,804	141,701	99,128	31,377	22,881	21,256
Silk Manufactures	.. .. ..	4,715	4,731	20,356	13,849	11,166	10,833	4,412	4,617	4,386
Soap, viz.: Not Perfumed	.. lbs.	1,745,072	1,024,912	4,241,855	5,587,804	7,265,131	6,606,775	6,944,696	7,891,443	5,941,385
Spirits, all sorts	.. .. galls.	58,063	64,785	172,704	210,187	283,038	285,963	241,273	173,454	155,104
Sugar, Unrefined	.. lbs.	10,912,018	13,987,004	20,605,209	31,237,737	35,363,115	38,971,709	30,070,163	28,478,961	25,365,999
Refined or Candy	.. ..	604,240	544,729	707,328	662,568	980,434	1,041,778	923,164	1,124,345	1,091,744
Molasses	.. ..	380,760	518,849	924,107	2,301,492	255,962	10,009	3,457	28,953	4,973
Tea	.. ..	285,928	378,931	827,911	945,540	1,049,861	1,042,744	1,166,925	1,002,732	981,173
Tobacco: Unmanufactured	.. ..	69,913	96,032	96,679	135,424	131,499	142,134	168,078	100,404	150,810
Manufactured	.. ..	79,893	140,299	318,489	339,337	443,256	418,339	342,036	163,975	142,726
Cigars	.. .. No.	1,630,400	2,191,050	4,802,788	1,443,125	620,350	314,300	230,250	..	..
Cigars	.. .. lbs.	375	1,592	10,440	96,886	152,340	166,241	112,834	52,973	56,191
Wine	.. .. galls.	18,241	34,564	49,830	64,782	89,262	85,104	56,520	23,674	18,078
Wood: Unmanufactured	.. cub. ft.	278,414	462,668	1,149,422	1,275,311	2,347,108	1,927,848	1,288,418	597,465	1,039,447
Woollen Manufactures	.. .. value £	98,475	125,371	259,762	308,226	310,865	388,025	183,162	138,176	150,518

*Ibs.

F. W. BURROWES, Collector.

TURN OVER.

B.—CUSTOMS TRADE RETURNS.

3.—Return of the Quantity of the principal Articles of Colonial Produce Exported.

ARTICLES.		1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
Aloes	lbs.	846,168	502,291	374,142	421,494	340,819	809,907	806,198	860,010	942,637
Argol	,,	68,656	80,762	78,229	113,982	65,341	219,839	189,434	220,904	213,812
Copper Ore	tons.	4,598	7,309	12,418	15,319	13,134	19,669	22,705	20,348	20,213
Corn, Grain and Meal	lbs.	4,327,309	9,017,392	877,258	853,836	1,399,916	1,646,467	1,549,173	2,560,417	1,613,432
Cotton	,,	Nil.	1,928	10,322	Nil.	8,048	96	11	Nil.	Nil.
Feathers, Ostrich	,,	17,522	28,708	49,569	163,065	193,612	253,954	247,179	233,411	251,084
Fish, salted or cured	,,	2,903,788	3,393,327	3,372,701	4,133,134	3,407,296	4,066,787	4,231,767	2,741,966	2,906,493
Fruit, dried	,,	780,958	593,987	663,931	65,301	30,946	32,810	248,912	135,779	231,143
Hair, Angora	,,	6,992	403,153	1,147,453	2,590,232	4,146,128	3,776,637	4,443,971	4,329,535	5,251,301
Hides, Ox and Cow	No.	14,036	34,988	109,202	67,332	113,905	110,362	142,945	207,136	290,019
Horns, Ox and Cow	,,	59,186	78,723	114,266	181,121	196,604	309,662	324,530	423,174	436,229
Horses	,,	98	173	29	Nil.	437	2	33	46	19
Ivory	lbs.	56,496	52,945	143,682	46,779	59,442	10,205	11,915	10,487	9,244
Precious Stones, Diamonds	No.	Nil.	3,804	Not	Stated.	Not	Stated.			
Skins, Goat	,,	340,057	893,310	1,393,624	804,339	598,473	1,094,628	1,158,873	1,127,714	1,302,120
,, Sheep	,,	970,128	1,484,076	1,558,628	1,941,628	1,834,040	2,007,212	2,185,489	2,319,954	2,625,216
Spirits, Brandy	galls.	30,346	304	1,149	960	615	449	3,637	2,953	4,317
Wine, Constantia	,,	2,185	1,008	4,423	2,387	1,805	2,036	6,353	5,133	8,314
,, Ordinary	,,	192,809	88,533	55,319	61,771	48,740	44,088	115,499	89,981	83,754
Wool, Sheep's—										
Fleece, Washed	lbs.	32,767,678	12,693,974	11,306,560	7,527,030	7,305,736	6,547,604	5,621,968	5,971,354	4,392,080
Scoured	,,		16,107,892	20,403,365	19,950,782	21,621,898	17,652,935	19,317,428	17,453,419	17,638,876
Grease	,,		9,082,325	8,629,899	14,990,850	13,842,610	17,488,539	13,890,999	13,845,848	12,401,606
Value of above Articles	£	2,126,513	2,423,796	5,554,599	7,976,615	8,208,939	8,274,466	6,916,173	6,678,663	5,596,153
Value of other Articles of Colonial Produce Exported	£	18,721	29,972	81,499	61,269	107,395	49,662	55,127	67,607	52,993

CUSTOMS TRADE RETURNS.

4.—Return of the Value of the principal Articles of Colonial Produce Exported.

ARTICLES.	1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
	£	£	£	£	£	£	£	£	£
Aloes	9,481	2,715	3,218	4,909	4,233	10,841	10,258	9,973	8,228
Argol	2,219	1,341	2,293	2,879	1,604	5,622	5,591	6,823	6,497
Copper, Ore	118,297	146,368	248,337	306,790	261,110	394,932	454,113	405,415	395,673
Corn, Grain and Meal	39,246	33,241	3,490	3,042	9,630	8,788	6,816	7,993	4,974
Cotton	Nil.	91	628	Nil.	50	3	1	Nil.	Nil.
Feathers, Ostrich	63,736	87,074	304,933	883,632	894,241	1,093,989	931,380	966,479	883,278
Fish, salted or cured	52,977	51,976	17,823	27,616	33,428	26,334	22,198	16,396	13,852
Fruit, Dried	11,991	6,599	10,210	1,249	761	1,038	3,665	1,459	2,596
Hair, Angora	368	26,672	133,180	206,471	262,660	253,128	271,804	239,873	294,018
Hides, Ox and Cow	9,724	21,710	38,964	26,691	49,923	57,019	83,964	104,874	128,815
Horns, Ox and Cow	821	1,938	2,300	2,864	4,414	6,799	7,283	8,621	7,424
Horses	3,275	6,945	1,055	Nil.	13,748	17	4,985	3,753	3,110
Ivory	10,666	13,746	60,402	16,982	17,081	4,019	3,746	3,879	3,520
Precious Stones, Diamonds	Nil.	153,460	1,348,634	3,367,997	4,176,242	3,992,502	2,742,470	2,807,329	2,489,630
Skins, Goat	69,621	126,112	158,404	167,428	201,933	218,326	122,796	151,699	161,389
,, Sheep	79,160	87,240	147,842	172,264	194,913	227,112	238,199	213,793	192,631
Spirits, viz., Brandy	3,899	77	324	328	281	199	4,124	894	1,874
Wine, Constantia	1,217	777	1,896	1,397	1,944	1,359	2,371	1,779	2,067
,, Ordinary	24,499	13,887	12,817	11,996	11,719	10,299	21,474	15,922	14,456
Wool, Sheep's—									
Fleece, Washed	1,680,826	513,117	702,354	395,966	337,266	311,717	262,853	267,365	164,877
Scoured		934,726	1,834,114	1,817,630	1,627,174	1,227,274	1,340,287	1,109,834	976,389
Grease		221,675	319,431	518,773	417,497	323,189	389,804	375,994	294,322

F. W. BURROWES, Collector.

SPECIE.

Return of the Value of Specie Imported and Exported.

Particulars.	1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
	£	£	£	£	£	£	£	£	£
Imports	14,000	159,000	31,424	429,184	559,909	288,022	210,551	11,697	218,784
Exports	78,178	33,712	185,726	147,854	203,492	54,858	425,117	86,970	412,817

Custom House, Cape Town.

IMPERIAL GOVERNMENT ARTICLES.

Return of the Value of Imperial Government Articles (excluding Specie) Imported and Exported.

Particulars.	1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
	£	£	£	£	£	£	£	£	£
Imports	3,503	4,406	8,449	647	16,716	3,128	3,482	5,796	3,668
Exports	No account		kept.	No account		kept.	..	..	..

COLONIAL GOVERNMENT ARTICLES.

Return of the Value of Colonial Government Articles (excluding Specie) Imported and Exported.

Particulars.	1865.	1870.	1875.	1880.	1881.	1882.	1883.	1884.	1885.
	£	£	£	£	£	£	£	£	£
Imports	8,001	6,369	489,381	402,973	251,084	787,189	906,615	298,670	292,167
Exports	No account		kept.	No account		kept.	..	..	..

F. W. BURROWES, Collector.

C.—Expenditure of the Colony of the Cape of Good Hope for Nine Financial Years, from 30th June, 1876 to 30th June, 1885, chargeable against ordinary Revenue.

	1876-7.	1877-8.	1878-9.	1879-80.	1880-1.	1881-2.	1882-3.	1883-4.	1884-5.	Totals.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.—Legislature	6,930 14 3	16,974 14 11	16,017 5 6	17,332 6 7	29,248 9 5	19,351 9 5	13,011 12 10	21,477 8 11	19,169 3 11	159,513 5 9
2.—Civil Establishments (including Collection of Revenue)	79,726 15 5	81,897 4 1	84,310 12 9	100,332 14 9	103,250 2 4	120,528 3 3	122,753 3 5	118,482 12 10	131,752 19 7	943,034 8 5
3.—Medical (including Hospitals and Paupers)	54,279 18 10	55,657 7 4	57,605 10 1	61,046 5 5	62,913 7 1	80,854 10 3	94,932 14 8	78,004 11 2	70,651 13 7	615,945 18 5
4.—Science and Educational (other than of Natives)	49,041 0 9	55,218 18 11	57,989 19 1	65,216 11 10	69,743 2 10	75,955 2 6	82,049 14 8	83,120 11 8	81,875 1 2	620,810 3 5
5.—Public Worship	14,907 12 2	14,918 4 5	14,779 16 1	14,911 6 11	12,026 5 9	11,650 16 0	10,770 12 1	10,953 2 5	9,978 9 0	113,946 4 10
6.—Judicial (including Administration of Justice	73,613 16 8	68,406 7 6	75,547 18 1	79,547 9 11	95,348 2 6	103,998 3 4	113,158 14 11	112,276 14 1	107,413 11 8	829,310 18 8
7.—Police and Gaols	83,749 15 0	96,178 2 0	113,841 14 4	107,785 3 7	150,342 2 0	177,739 2 7	232,166 12 0	310,579 17 9	263,483 4 9	1,556,356 14 0
8.—Convicts	30,318 16 4	38,107 1 11	58,997 12 7	64,120 15 5	53,257 1 6	53,200 14 9	64,755 12 0	70,622 9 4	66,696 1 10	500,076 5 8
9.—Crown Lands, Agriculture, Forests, Irrigation and Harbours	44,041 12 3	54,502 5 4	55,788 5 7	63,222 14 1	70,051 16 6	101,972 4 1	90,541 8 4	93,908 16 2	80,683 17 0	660,712 19 4
10.—Railways, Working and Maintenance	219,994 11 4	260,105 17 0	348,253 11 4	458,775 19 1	570,126 9 6	764,399 16 0	753,312 2 4	614,331 0 9	631,472 16 2	4,610,772 3 6
11.—Telegraphs, Construction	28,781 2 6	2,987 8 0	..	43,010 18 6	62,233 0 3	69,369 18 6	73,876 12 5	78,159 11 6	191,486 2 3	1,659,956 10 10
Maintenance	22,839 1 6	29,366 13 6	31,428 16 8	174,595 16 8	192,212 12 1	225,349 4 6	240,196 18 11	218,838 6 2	54,361 17 1	1,092,926 10 2
12.—Post Office and Mails	114,168 14 7	141,251 0 9	161,866 14 11	117,039 16 11	159,050 14 4	174,369 6 6	182,779 16 6	94,419 7 1	127,843 8 1	1,143,930 8 2
13.—Buildings, Roads and Bridges	162,920 11 2	84,577 1 0	72,407 19 7	119,176 3 5	148,430 5 8	147,538 8 10	*264,951 10 8	149,642 13 10	106,186 1 3	1,782,604 12 10
14.—Native Affairs, including Education of Natives	56,135 16 3	59,958 2 6	80,133 18 11	175,477 0 7	207,486 16 7	219,838 3 8	234,038 3 5	2,121 17 10	506 1 3	127,677 11 10
15.—Defence	204,751 1 3	197,635 18 7	145,003 18 7	18,121 1 11	10,138 16 1	3,027 7 11	4,057 19 10	38,957 12 2	41,481 16 2	327,379 2 11
16.—Immigration	48,079 3 1	40,845 7 10	31,798 3 4	36,421 10 0	37,960 14 9	49,220 16 3	44,033 1 2	26,845 5 1	27,906 7 11	177,631 17 1
17.—Pensions	2,358 10 1	28,446 19 0	15,628 0 6	23,067 17 3	21,954 12 9	22,859 4 11	29,511 2 11	54,479 19 4	438,725 5 3	
18.—Refunds of Revenue	4,035 18 1	5,713 7 8	34,202 12 3	39,262 7 2	96,975 17 4	62,895 4 5	61,437 13 6	46,066 10 8	1,180,289 15 7	6,241,884 2 8
19.—Miscellaneous	23,927 15 0	19,477 5 7	452,357 12 10	486,593 8 3	667,299 13 0	801,157 19 4	931,215 10 5	1,131,245 8 0		
20.—Public Debt	252,017 7 8	339,707 7 7								
	1,601,610 14 2	1,691,922 15 5	1,916,081 4 11	2,237,075 2 5	2,806,022 14 9	3,278,785 5 3	3,686,288 0 9	3,502,487 12 11	3,375,682 1 6	24,115,965 12 1

* Note.—Includes over £100,000 spent on Basutoland (from which Territory no revenue was received), of which £75,000 was for compensation to loyal Basutos.

C. ABERCROMBIE SMITH, Controller and Auditor-General.

[TURN OVER.

D.—Expenditure on Services for which Loans have been raised under the authority of Acts of the Colonial Parliament.

	From 1st Jan., 1870, to 31st Dec. 1875.	Jan. to June, 1876.	1876—7.	1877—8.	1878—9.	1879—80.	1880—1.	1881—2.	1882—3.	1883—4.	1884—5.	Total to 31st June, 1885.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Railways	2,070,354 9 7	638,373 7 4	1,806,081 9 7	1,290,856 0 0	1,280,452 19 8	1,041,780 18 6	580,565 6 9	661,666 14 9	2,188,658 5 0	1,522,150 18 5	665,787 17 4	13,746,728 6 11
East London Harbour	90,115 5 8	17,594 11 1	44,616 5 0	41,752 1 10	37,189 4 10	42,231 15 6	44,151 8 0	58,839 13 11	62,262 11 7	46,611 3 11	16,825 16 11	502,189 18 3
Kowie Harbour	162,269 1 2	..	15,159 13 4	14,045 15 3	12,638 15 2	8,922 7 11	16,436 4 0	19,398 5 9	17,049 1 8	12,794 16 4	11,933 15 2	290,647 15 9
Bridges	4,396 6 10	20,276 17 4	66,702 0 7	102,534 0 2	103,804 6 7	56,806 3 3	24,428 11 9	16,583 3 1	13,406 8 9	533 11 0	6,673 1 1	416,144 10 5
Buildings	..	..	..	..	..	3,920 1 1	18,715 13 2	15,044 6 8	30,143 17 9	95,759 15 11	49,706 0 2	213,289 14 9
Telegraphs	..	..	..	28,253 15 0	—5,500 3 5	23,703 11 10	47,624 15 5	32,288 16 5	32,838 14 5	2,242 13 5	3,646 0 0	165,097 18 1
Irrigation Works	..	..	..	..	..	..	..	..	15,003 0 7	15,316 6 10	3,059 19 1	33,379 6 6
Immigration	..	..	..	..	..	19,417 17 3	15,186 11 8	23,171 13 8	18,528 19 3	6,349 18 6	3,217 4 8	85,872 5 0
Native Rebellion	..	..	..	490,072 6 7	649,714 10 5	288,782 18 10	1,669,565 12 9	1,389,840 3 8	213,996 4 4	60,389 12 8	32,401 4 1	4,794,762 13 4
Griqualand West Liabilities	..	..	..	..	..	..	295,670 0 9	23,096 19 10	1,467 6 10	—503 17 7	—9,067 10 7	310,662 19 3
Loans for Local Works and Irrigation	..	..	..	..	..	..	..	..	58,374 16 0	108,748 11 7	51,978 12 7	219,102 0 2
					2,083,799 16 8					1,870,897 8 7	845,229 11 1	
					—5,500 3 5					—503 17 7	—9,067 10 7	
	*2,327,135 3 3	676,244 15 9	1,932,559 8 6	1,967,513 18 10	2,078,299 13 3	1,485,565 14 2	2,712,343 19 3	2,239,929 17 9	2,651,729 6 2	1,870,393 11 6	836,162 0 6	20,777,877 8 5

* This Return does not include over £585,000 spent between 1857 and 1880 under the authority of Loan Acts, on Railways, Roads, Bridges, Gaols, Hospitals and Immigration, and included in ordinary Expenditure.

NOTE.—Figures preceded by "—" must be deducted.

C. ABERCROMBIE SMITH, Controller and Auditor-General.

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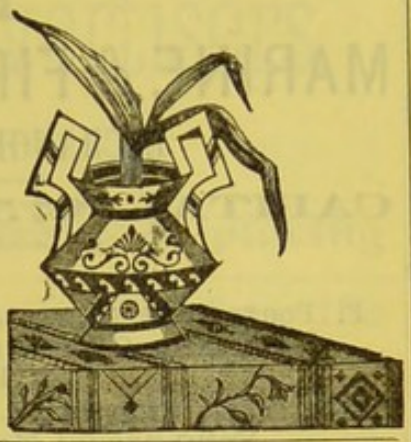
BEFORE LEAVING LONDON

CALL AND INSPECT THE



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GOLD MEDAL. AMSTERDAM EXHIBITION, 1883.

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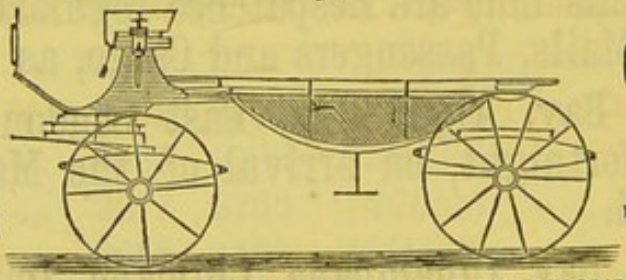

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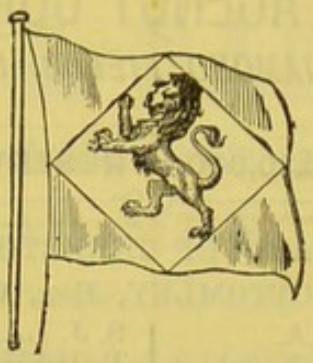

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