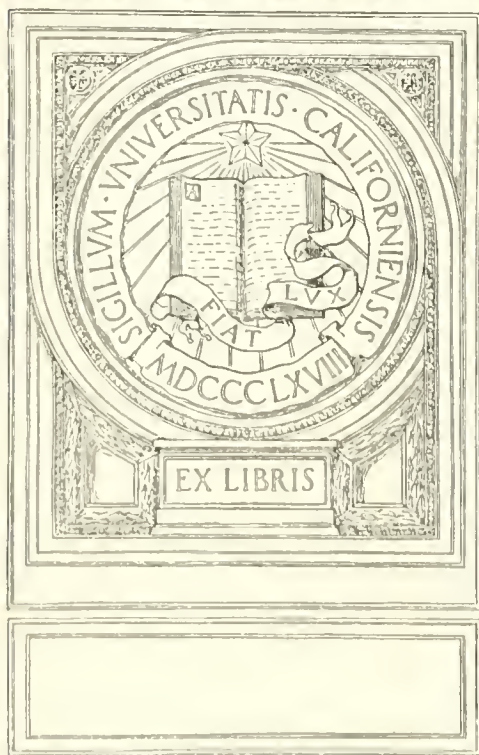


ANTARCTICA

EDWIN SWIFT BALCH

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES



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with the compliments of
the author.

ANTARCTICA

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RECORDS OF THE GEOGRAPHICAL SURVEY
JUL 3 1936

TO THE MEMORY OF
CHARLES WILKES, NATHANIEL B. PALMER,
THE AMERICAN SEALERS,
AND THE
OFFICERS AND MEN OF THE UNITED STATES NAVY,
WHO EXPLORED THE ANTARCTIC.

249218

“The ship drove fast, loud roared the blast
And southward aye we fled.

“And now there came both mist and snow,
And it grew wondrous cold:
And ice, mast high, came floating by,
As green as emerald.

“And through the drifts the snowy clifts
Did send a dismal sheen:
Nor shapes of men nor beasts we ken—
The ice was all between.

“The ice was here, the ice was there,
The ice was all around:
It cracked and growled, and roared and howled,
Like noises in a swound!”

COLERIDGE.

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INTRODUCTION.

THIS monograph originated in a letter—asserting the discovery by Americans of the South Polar continent—which I wrote to *The Nation*, New York, and which was published in that paper and also in *The Evening Post*, New York, on May 10th, 1900. The difficulty of obtaining accurate information about the Antarctic induced further research, the results of which were embodied in a paper “Antarctica, a history of Antarctic Discovery.” This, through the kindness of Mr. F. Lynwood Garrison and Dr. William H. Wahl, was published in *The Journal of the Franklin Institute*, 1901, Vol. CLI., pages 241–262, 321–341, 413–428, Vol. CLII., pages 26–45; and of this paper the present book is an enlargement, containing a number of changes and corrections and much additional material collected in some of the more important European libraries.

Nevertheless, it is impossible that this work should be complete or more than approximately accurate. The records of the Antarctic are lamentably imperfect, except in the case of the few national expeditions and of one or two of the sealing voyages. Of some of the latter only brief notes were published;

of others, accounts possibly remain in the shape of log books still in manuscript; while of others, doubtless all trace has disappeared. Then again the rarer books and documents are not found in any one spot. This prevents in many cases verifying the quotations and data, jotted down in pencil from the originals in various libraries, by referring anew to the originals, and a certain number of errors due to mistakes in transcription are therefore unavoidable. It is hoped, however, that this book is a step towards clearing up the story of the Antarctic, and especially that it may incite other geographers to make further researches into the original records.

A number of gentlemen have helped me in one way or another. I am especially indebted to Mr. Henryk Arctowski, of Brussels; Mr. J. Bruggeman, of the Hague; Dr. Frederick A. Cook, of Brooklyn; Professor George Davidson, of San Francisco; Monsieur Graz, of Paris; Mr. George C. Hurlbut and Mr. V. H. Paltsits, of New York City; Mr. G. W. Littlehales and Mr. P. Lee Phillips, of Washington, D. C.; Mr. J. T. Kiernan and Mr. P. H. Tufts, of Cambridge, Mass.; Dr. W. E. Peschel and Dr. Arthur Richter, of Dresden; Mr. J. P. de Sauvage, of Leyden; Captain C. C. Todd, of the United States Navy; and Mr. A. J. Drexel-Biddle, Mr. Edward Miles, Mr. Bunford Samuel, and Mr. Harvey M. Watts, of Philadelphia.

ANTARCTICA.

I.

THE LEGENDARY "TERRA AUSTRALIS INCOGNITA" AND
VOYAGES LEADING FROM A BELIEF TO A DISBELIEF
IN IT.

"Antarctica" is a term which is slowly coming into use to designate the continent which probably extends across the regions of the South Pole. The word itself is an old one, since one of the letters of Amerigo Vespucci was issued at Strasburg in 1505 under the title of *Be [De] Ora Antarctica*. As a proper name, "Antarctica" is recent, but it seems probable that it will be adopted generally for the lands around the South Pole; the expression "the Antarctic" continuing to be used as the appellation of the entire region, including lands, islands, ice and ocean. While both terms are still somewhat vague, the last one is especially so, for geographers are not yet agreed as to the limits of the Antarctic. It undoubtedly includes everything south of 60° south latitude, but probably an irregular line of demarcation would represent its area more accurately: for it seems as if Bouvet and

Kerguelen Islands and South Georgia, for many reasons, such as their fauna, their climate and their physical characteristics, belonged to the Antarctic proper. However this may be, and whatever the limits eventually assigned to austral regions by geographers, the term "the Antarctic" will be used in this monograph to designate the south polar region, including Bouvet and Kerguelen Islands and South Georgia, as a whole, and the term "Antarctica" will be used to designate the great mass or masses of land in the neighborhood of the South Pole itself.

There is, however, a lacuna in antarctic nomenclature which slowly forced itself to my notice while attempting to unravel somewhat the tangled and imperfect records of south polar exploration, and that is that there is no generic name, either for the lands south of Australia or for the lands south of South America. For the name "Antarctic Continent" given by Wilkes when he, first of all men, became aware that there was a continent in the neighborhood of the South Pole, must be held to include the lands south of South America, as well as those south of Australia: and moreover the name "Antarctic Continent" is rapidly becoming superseded, as a generic term, by the shorter "Antarctica." The want of a name for the lands south of South America, however, is especially troublesome, for all the names at present in use—South Shetland, Louis Philippe Land, Palmer Land, Foyen Land, Graham Land, Alexander Land—are

strictly local. It is necessary, therefore, to find some term in place of the cumbersome phrases "the lands south of Australia" and "the lands south of South America" and taking North America and South America as models, it seems as if "East Antarctica" and "West Antarctica" answered the necessity satisfactorily. It remains to be seen whether other geographers will see fit to adopt these terms, but they will be used in this monograph for the sake of convenience, brevity and clearness.¹

¹Sir Clements R. Markham, the President of the Royal Geographical Society, proposed in 1899 (*The Geographical Journal*, 1899, Vol. XIV., pages 473-481: "The Antarctic Expeditions,") to divide the Antarctic into four quadrants, each covering ninety degrees of longitude, and to bear English names. On the score of convenience, this proposal has nothing to recommend it: for there is no way by which anyone can associate the positions of these so called quadrants with the proposed names. On the score of justice, this suggestion is even worse: for it is evidently absolutely unfair that only English names should be commemorated. If any such arrangement were ever adopted, it should be so only by an international agreement, and international courtesy would certainly require that the names of Bellingshausen, D'Urville and Wilkes should be remembered. It is inconceivable, however, that geographers will adopt as it stands this unique proposition.

Edward Stanford, 12, 13 and 14, Long Acre, London, W. C., published a "South Polar Chart" on 22nd July 1901, showing Sir C. R. Markham's quadrants. In refreshing contrast is the map published in *The Graphic*, London, August 10, 1901, Vol. LXIV, page 172, by Dr. J. Scott Keltie, the able Secretary of the Royal Geographical Society. This gentleman marks Wilkes Land and divides the Antarctic into "German Sphere of Exploration" and "British Sphere of Exploration."

Of no part of the world is so little known as about the Antarctic, and about none has there been so little interest taken. This is probably due, partly to its distance from the centers of thought, and partly also to its lack of life, both of animals and of men. The human interest is entirely absent in the desolate wastes of the South Pole, and not the least curious fact connected with them is that there is no apparent record of any woman having passed beyond 60° south latitude. How great a part of the world's surface still remains unexplored may be gathered from the fact, so well explained by Dr. Reiter,² that the continent of Antarctica may be about as large as the portion of South America extending from Cape Hoorn to Manaos and at its widest point from the Atlantic to the Pacific. Dr. Supan³ also gives a clue as to the dimensions of the unknown south, when he says that "the entirely unknown Arctic is at least as big as European Russia, while the unknown Antarctic is twice as big as Europe."

That this continent was bigger in former æons scarcely admits a doubt.⁴ In all probability Ant-

² *Zeitschrift für wissenschaftliche Geographie*, Weimar, VI., 1888, pages 1-30:—Reiter, Dr. Hans: "Die Südpolarfrage und ihre Bedeutung für die genetische Gliederung der Erdoberfläche." This paper is illustrated with a chart showing the probable outlines of Antarctica.

³ *Dr. A. Petermann's Mitteilungen*, Gotha, 43 Band, 1897, pages 15-18:—Supan, Alex.: "Unbekannte Polargebiete."

⁴ This paragraph is founded on Mr. Forbes' interesting paper: *Annual Report of the Board of Regents of the Smithson-*

arctica has been connected with South America, Australia and New Zealand, and South Africa: most likely not with all three at the same time. This is evidenced by the living and fossil faunas and floras of these lands. For instance, in the ostrich group, there are living the ostrich in Africa, the rhea in South America, the emu in Australia, the cassowary in New Guinea; and there are extinct the æpyornis in Madagascar, the brontornis in Patagonia, the moa in New Zealand, and the dromormis in Australia. The owl-parrots and keas of New Zealand resemble the macaws of South America. The southern salmon and southern pikes are common to New Zealand, Patagonia and the Falklands. Among plants "the genus *cryptocarya* of the *perseaceæ* is common to New Zealand, South Africa and South America, while among the genera of other families we find some occurring in Africa, or Madagascar and Australia, some in Tasmania and South America only; while others crop up in South Africa and Australia, or New Zealand, or in New Zealand and South America only." In fact it is highly probable that many forms of terrestrial life had

ian Institution, to July 1894; Washington, Government Printing Office, 1896, pages 297-316:—Forbes, Henry O.: "Antarctica, a vanished austral land." Reprinted from the *Fortnightly Review*, February, 1894, Vol. LV., New Ser., No. 126.

There is also a note on the similarity of some earth worms in New Zealand, Patagonia, and South Georgia in *Nature*, London & New York, Vol. LIII., 1895-1896, page 129:—Beddard, Frank E.: "The former northward extension of The Antarctic Continent."

the original center of their development and dispersal in Antarctica.

That some great land existed near the South Pole seems to have been guessed at centuries ago. It is hard to see on what the belief rested, but it lasted until Captain Cook's second voyage. The ancients surmised that land existed somewhere below the Equator and this belief descended as a sort of legend in books and maps.⁵ There is no apparent evidence, however, to show that, before the third voyage of Amerigo Vespucci, any ideas about the far southern regions were based on anything but imagination.

It is possible that a Chaldaean, Seleukos, started the idea of a southern continent. Dr. Ruge,⁶ a careful student, tells us that Seleukos was an inhabitant of the town of Seleukeia on the Tigris, and that he lived between about 170 B. C. and 125 B. C. Dr. Ruge's

⁵ There are at least three valuable bibliographies of papers and books about the Antarctic:

Chavanne, Dr. Josef; Karpf, Dr. Alois; LeMonnier, Franz, Ritter von: *Die Literatur über die Polar Regionen der Erde*; Wien, 1878; Verlag der K. K. Geog. Ges. oder bei Ed. Hölzel: (Soc. de Géog. Paris).

Scottish Geographical Magazine, Vol. XIV., Edinburgh, 1898, pages 563-570:—Bartholomew, J. G., F. R. S. E., Hon. Sec. R. S. G. S.: "Antarctic Bibliography."

The Antarctic Manual, London, Royal Geographical Society, 1901; pages 515-580:—Mill, Dr. Hugh Robert: "A Bibliography of Antarctic Exploration and Research."

⁶ Ruge, Dr. Sophus: *Der Chaldäer Seleukos*, Dresden, G. Schönfeld, 1865: (British Museum).

researches led him to the conclusion⁷ "that the last provable source for the hypothesis of Hipparchus, Marinus and Ptolemy is to be found in Seleukos. The Babylonian is therefore the oldest *savant*, who set forth a closed-in southern sea."

Hipparchus is supposed to have believed in a southern continent. At least Vivien de Saint Martin⁸ published a map "Carte d'Hipparque vers 150 av. J. C." in which the African coast extends east from Zanzibar, runs beyond Taprobane (India) and then rejoins Asia, forming a closed Erythryan Sea.

Aristotle⁹ speaks of two segments of the habitable earth, of which one is towards the north, and the other towards the south.

Dr. Franz Wieser¹⁰ says that Krates, Eratosthenes, in fact the Alexandrine philosophers, believed in

⁷ *Der Chaldäer*, etc., page 22.

⁸ *Atlas dressé pour l'Histoire de la Géographie*, etc., Paris, Hachette, 1874; Planche II., No. VI.

⁹ *Aristotelis Opera Omnia*, etc. * * * Authore Guilleimo Du Val * * * Lutetiae * * * MDCXIX.: (Lib. Co. Philadelphia): "Meteorologicorum," Lib. II., Chap. V.: "Nam cum terrae habitabilis segmenta duo sint, & altera ad sublimiorem verticem qui apud nos est, altera ad alterum & meridiem posita sit, atque tympani speciem praeferat, talem profecto terrae figuram linea à centro ipsius ductae dissecant, atque turbines duos efficiunt:" etc.

¹⁰ Wieser, Dr. Franz: *Magalhães Strasse und Austral Continent auf den Globen des Johannes Schöner*, Innsbruck, Wagner'schen Universitaets-Buchhandlung, 1881, page 59.

southern lands. Mr. R. H. Major¹¹ states that Aratus, Strabo, and Geminus held opinions similar to Aristotle.

There is a paragraph in Pomponius Mela¹² saying that the earth is divided into five zones, of which the middle one is burnt up with heat, those at the ends are frigid with a terrific cold, and that of the remaining two we inhabit one and our antipodes the other.

In Macrobius¹³ also there is a passage which seems to indicate that he held a similar belief.

¹¹ Major, R. H. : *Early Voyages to Terra Australis, now called Australia*, London * * * Hakluyt Society, MDCCCLIX., page xiii.

¹² *Dionysii Alex. et Pomp. Melae Situs orbis descriptio*, In Melam annotationes Joannis Oliuarii, Henricus Stephanus, MDLXXVII. : and *Pomponii Melae, De Situ orbis Libri III.* : (Lib. Co. Philadelphia).

Pomponius Mela, traduit en Français, * * * par C. P. Fradin, Paris, 1804 : (Lib. Co. Philadelphia) : Lib. I., Chap. I. "Iuic medio terra sublimis cingitur undique mari : eodemque in duo latera, quae Hemisphaeria nominantur, ab oriente divisa ad occasum, zonis quinque distinguitur. Mediam aestus infestat, frigus ultimas : reliquae habitabilis paria agunt anni tempora, verum non pariter. Antichthones alteram, nos alteram incolimus. Illius situ ob ardorem intercedentis plagae incognito, hujus dicendus est."

¹³ *Macrobius : Franciscus Eysenhardt recognovit* ; Lipsiae, B. G. Teubneri, MDCCCLXVIII. : "Ambrosii Theodosii Macrobiani viri clarissimi et illustris commentariorum in somnium Scipionis" ; Libri II., 9.

Macrobiani Ambrosii Aurelii, viri consularis & illustris, In Somnium Scipionis, Lib. II., etc., Lugduni, apud Ant. Gryphium, MDLXXXV. : (Lib. Co. Philadelphia). On page 91 is a map, which had been published already in earlier editions, showing an antipodal frigid land.

Manilius¹⁴ wrote that there is a southern habitable land, and that it lies under our feet.

Dr. Werner¹⁵ states that Baeda Venerabilis, who was born probably in 672 and died May 26, 735, believed apparently that the poles were regions of eternal cold, because the sun never shone there. In the north he thought there was an ocean, but in the south a great land.

Professor Fellner¹⁶ says that Rhabanus Maurus was born in 776 or 788, was chosen Abbot of Fulda in 822, and died in 856 at Mainz. His principal work was *De Universo*. He mentioned three inhabited parts of the world, Europe, Asia and Africa, and wrote further:¹⁷ "Besides the three named parts of the

¹⁴ *M. Manili Astronomicon*, Heidelberg, 1590; and the same, Lugduno Batauae, 1600: (Lib. Co. Philadelphia). Liber I., line 234, *et seq.* :

"Ex quo colligitur Terrarum forma rotunda,
Hanc circum variae gentes hominum atque ferarum,
Aeriaeque colunt volucres, pars eius ad Arctos
Eminet. Austrinis pars est habitabilis oris,
Sub pedibusque iacet nostris, supraque videtur
ipsa sibi fallente solo declinia longa,
Et pariter surgente via, pariterque cadente."

¹⁵ Werner, Prof. Dr. Karl: *Beda der Ehrwürdige und seine Zeit*, Wien, Wilhelm Braumüller, 1875, page 110: (Kön. Oef. Bib. Dresden). Dr. Werner drew his material from Bede's works: *De Natura rerum*; *De temporibus*; *De temporum ratione*; *De ratione computi*.

¹⁶ Fellner, Professor Stefan, Benediktiner des Stiftes Schotten in Wien: *Compendium der Naturwissenschaften an der Schule zu Fulda im IX. Jahrhundert*; Berlin, Theobald Grieben, 1879.

¹⁷ *Compendium*, etc., page 104.

earth, there lies a fourth on the other side of the ocean in the south. According to fable it is inhabited by the Antipodes: on account of the heat of the sun it is unknown to us."

Dr. Werner¹⁸ says that Guillaume de Conches, a philosopher and cosmographer of the first half of the twelfth century, believed that there were two continents on the unknown parts of the earth. He thought that an ocean belted the world at the equator, and that one of these continents was in the southern hemisphere.

Professor Schmidt¹⁹ states that Albertus Magnus was perhaps a personal friend of Dante, and that in his principal work, *De Nat. loc.* I, c. 7,²⁰ for various reasons, Albertus considered that the western portion of the earth must contain a great land reaching from north to south. Guessing a little more, Albertus assumed that the warmth of the sun would bring forth living organisms, that therefore there must be portions of the world benefiting by these conditions, and

¹⁸ *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften: Philosophisch-Historische Classe*, Wien, 1873; LXXV. Band, III. Heft, Jahrgang 1873, December; pages 309-403:—Werner, Prof. Dr. Karl: "Die Kosmologie und Naturlehre des Scholastischen Mittelalters mit spezieller Beziehung auf Wilhelm von Conches"; page 373: (Kön. Oef. Bib. Dresden).

¹⁹ Schmidt, Prof. Wilhelm: *Ueber Dante's Stellung in die Geschichte der Kosmographie*: "Erster Theil; Die Schrift De Aqua et Terra"; Graz, K. K. zweiten Gymnasium zu Graz, 1876.

²⁰ *Ueber Dante's*, etc., page 25.

that the deserts alone stopped intercourse with the peoples inhabiting these lands.

Dr. Werner²¹ writes that Roger Bacon held that the greatest part of the southern hemisphere must be land.

Dr. Peschel²² says that in early Christian times there was an idea prevalent that there must be less water than land on the earth, as it would have been to doubt the wisdom of the Creator to think that there was not as much habitable as uninhabitable space.

Some of the Arab geographers believed in a southern land. Lelewel²³ reconstructs the maps of Abu Rihan, Birunensis, 1030. In the "Quadrans Habitabilis" a coast line stretches from about Zanzibar, called Sofala, due east as far as the longitude of the coast of China; it then turns south again.

²¹ *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften: Philosophisch-Historische Classe*; Wien, 94 Band, Jahrgang 1879; Heft I., II.:—Werner, Prof. Dr. Karl: "Die Kosmologie und allgemeine Naturlehre des Roger Baco," pages 603, 604.

About the character and works of Bacon, see the address by Thomas Balch: *Report on the Twenty Fourth Exhibition * * * from November 14 to December 2, 1854, * * * by the Franklin Institute, * * * and the Address delivered at the close of the exhibition by Thomas Balch, Esq.*; pages 79-84; Philadelphia, Barnard & Jones, 1855.

²² Peschel, Oscar: *Geschichte der Erdkunde*, München, J. G. Cotta'schen Buchhandlung, 1865, pages 327-330.

²³ Lelewel, Joachim: *Géographie du Moyen Age*: Bruxelles, V^o et J. J. Pillet, 1852; also *Épilogue*, 1857; and *Atlas*, 1850, Planche V.: (Kön. Oef. Bib. Dresden).

There is a little map, said to be now in Copenhagen, and which I have seen only in the facsimile of Jomard.²⁴ It is considered to be of the tenth century, and to be Icelandic in origin. There are only four names on it: Europe, Asia, Africa and "Synn Bygd." The latter term has been assumed by some to mean a southern land, but this necessitates a lively imagination. The natural inference would seem to be that "Synn Bygd" refers to the Norse discoveries in North America. This also appears to be the opinion of Mr. Karl Wilhelmi.²⁵ Mr. John O'Farrell, of Philadelphia, has suggested a new explanation of this map, and that is that it is Irish. He submitted the name "Synn Bygd" to two Irish speaking persons, who pronounced it "Shin begweed" and said it meant "this place is unexplored" or "this place is not known."

There is an early map in the Biblioteca Reale in Turin, which I have seen only in the facsimiles published by Santarem,²⁶ Jomard²⁷ and Cortam-

²⁴ Jomard [Edme François]: *Les Monuments de la Géographie*; Sheet XIII., Map No. 3; (Pub. Lib. Boston).

²⁵ Wilhelmi, Karl: *Island, Iwitmannaland, Grönland und Vinland*, oder der Normanner Leben auf Island und Grönland und deren Fahrten nach Amerika: Heidelberg, J. C. B. Mohr, 1842: pages 227, 228; (Kön. Oef. Bib. Dresden).

²⁶ Vicomte de Santarem: *Atlas composé de mappemondes, de portulans, et de cartes hydrographiques et historiques*, etc.; publié sous les auspices du gouvernement Portugais; Paris, E. Thunot et Cie, MDCCCXLIX. The map is on the 11th sheet.

²⁷ Jomard: *Les Monuments de la Géographie*; Sheet XIII., Map No. 1.

bert.²⁸ It has been assigned to the tenth century, but it is in a manuscript of the twelfth century. Three parts of the world are indicated, Europe, Asia and Africa. South of the latter is a broad band of water, and below this is a space on which is an inscription²⁹ saying that besides the three parts of the world, there is a fourth part beyond the ocean, which is unknown to us on account of the heat of the sun, and which our antipodes are supposed to inhabit. In Paris also³⁰ there is a medal of the fifteenth century, reign of Charles VI. of France, on which is engraved a world chart with a southern continent called "Brumae."

The earliest published maps showing southern lands, which I have seen, are in some of the Ptolemies.³¹ In the 1478 Ptolemy³² the general map

²⁸ *Bulletin de la Société de Géographie*, Paris, 1877, Sixième Série, Tome XIII., Année 1877, pages 337-363 :—Cortambert, E: "Quelques uns des plus anciens monuments géographiques du moyen age conservés à la Bibliothèque Nationale."

²⁹ "Extra tres autem partes orbis, quarto pars trans oceanum inferior est, que solis ardore incognita nobis est, cujus finibus antipodes fabulosore inhabitare produntur."

³⁰ Flammarion, Camille: *Histoire du Ciel*, Paris, Hetzel & Cie, 1872. On page 369 is a reproduction of this medal which is said to be in the Bibliothèque Nationale.

³¹ A valuable contribution to the knowledge of the Ptolemies is: *Bibliographical Contributions, Library of Harvard University*, No. 18, Cambridge, Mass., 1884 :—Winsor, Justin: "A bibliography of Ptolemy's Geography."

³² *Claudii Ptolemei Alexandrini Philosophi Cosmographia*, etc., Rome 1478: (British Museum). This is supposed to be the first book with maps engraved on copper.

of the world gives "Indicum Mare" as a closed sea with a "Terra Incognita" about twenty degrees south of the Equator joining Asia beyond "Magnus Sinus" which is a gulf just beyond "Aurea Chersonesus." In the last map but one, of the eastern portion of India and "Aurea Chersonesus," the Indian Ocean is bounded on the east by a coast which descends southward beyond the "Magnus sinus."

In the 1462 or 1482 Ptolemy³³ the maps are rough and roughly colored. The southern land is given on the map of the world as in the 1478 Ptolemy, but the legend "Terra Incognita" is placed south of the sources of the Nile. In the map of the eastern part of India and Siam, there is again a coast represented as the eastern boundary to the Indian Ocean.

In the facsimile of the Mount Athos Ptolemy,³⁴ which is supposed to date from about the end of the twelfth century, plate "CVII." appears to show the beginning of the coast supposed to bound the Indian Ocean on the east. There does not seem to be any other southern land represented. The 1475 Ptolemy³⁵

³³ *Beatissimo patri Alexandro quinto pont. max. angelus D tépora Claudii Ptolemei uiri Alexandrini*, etc. : title page missing : on binding "Ptolemaeus, Ed. Princeps, 1462" : (British Museum).

³⁴ *Géographie de Ptolémée, reproduction photolithographique du manuscrit * * * au Mont Athos * * * d'après les clichés * * * de M. Pierre de Sévastianoff * * * par Victor Langlois ; Paris, Firmin Didot, 1867 : (Harvard Univ. Lib.).*

³⁵ *Cosmographia, latine reddita a Jac. Angelo : (Harvard Univ. Lib.).*

has no maps. Martin Behaim's famous globe of 1492 shows no antarctic land.³⁶

At last we come to a positive discovery, and one which must be looked on probably as the first discovery of land in the Antarctic. Amerigo Vespucci, in his letter to Pier Soderini, Gonfalonier of the Republic of Florence, narrates in his third voyage that, after leaving the coast of South America either in 32° or 40° south latitude, his ship reached 52° south latitude in April 1502 and that they sighted a new and rough coast along which they sailed for twenty leagues. His account is as follows:³⁷ "Having taken in our stores from this land, we began our voyage towards the southeast: and it was on the

³⁶The "Verwalter" of the Behaim estate told me that this globe is in Baron Behaim's house, Nürnberg, and that two hundred thousand marks had been offered for it. For Behaim's life, see Dr. F. W. Ghillany's excellent book: *Geschichte des Seefahrer's Ritter Martin Behaim*, Nürnberg, Bauer und Raspe, 1853: (Grossherz. Hof Bib. Darmstadt; Lib. Co., Philadelphia).

³⁷(First page) *Lcttera di Amerigo Vespucci delle isole nuouamente trouate in quattro suoi viaggi*: (Last page) *Data in Lisbona adi 4 di Settembre 1504, Seruitore Amerigo Vespucci in Lisbona*. This book was published probably in Florence in 1505; it is in the British Museum, and a note in it says: "This is supposed to be the first Italian edition of the four voyages." I copied the account from the "Terza Viaggio" as accurately as I could thus: "Facto nostro pue dimento di q̄sta terra | cominciāmo nostra nauicatione p eluen to sciloccho: & fu adi i 5 di Febraio | quando gia elsole sandaua cercando allo equinoctio | & tornaua uerso q̄sto nostro emisperio del settentrione & tanto nauigammo, per q̄sto uento | che ci trouāmo tanto alti | chel polo

15th of February when the sun was already nearing the equinox, and turning towards this our northern hemisphere: and so long did we sail by that wind, that we found ourselves so high that the southern

del meridione cistaua alto fuora del nostro orizzonte ben 52 gradi | & piu nô uedauamo le stelle ne dell orsa minore | ne della maggiore orsa: & di gia stauamo discosto del porro di doue partimo ben 500 leghe p sciloccho: & questo fu adi 3 daprile: & î q̄sto giorno comincio una tormenta in mare t̄ato forzosa | che cifece amainare del tucto nostre uele: & corrauamo allarbero seco con molto uento | che ere libeccio cō grandissimi mari | & laria molto tormentosa: e tanta era la tormēta | che tutta la flocta staua con gran timore: le nocte eron molto grandi: che nocte tenēmo adi septe daprile | che fu di 15 hore: pche elsole staua nel fine di Aries: et in q̄sta regione ere lo inuerno | come ben puo cōsiderare V. M. et andando î q̄sta tormenta adi septe daprile hauēmo uista di nuoua terra: della quale corrēmo circha di 20 leghe | & la trouāmo tucta costa braua: et nô uedēmo î epsa porta alcuno | ne gente: credo pche era t̄ato el freddo | che nessuno della flocta so poteua rimediare | ne sopportarlo: di modo ch' uistoci in tanto pericolo & î tanta tormēta | che apena potauamo hauere uista luna naue dell altra | p egran mari ch' faceuano | & p la gran serrazon del tēpo che accordāmo con el capitano maggiore fare segnale alla flocta che arriuassi | & la sciassimo la terra: et cene tornassimo al cāmino di Portogallo:” etc.

This passage was republished in Ramusio, Gio. Baltista: *Delle Navigazioni et Viaggi*, Venetia, Stamperia de Giunti, MDLXIII., Vol. I, page 126 [128]: “Di Amerigo Vespucci Fiorentino Lettera prima drizzata al Magnifico M. Pietro Soderini Gonfaloniere perpetuo della Magnifica & excelsa Signoria di Firenze”: (Bib. Royale, Bruxelles). I have not seen the earlier editions of Ramusio.

In the translation of this passage, I have availed myself, making a few changes, of the translation of Mr. Quaritch: *The First Four Voyages of Amerigo Vespucci*, London, Bernard Quaritch, 1893: pages 38, 39: (Lib. Co., Philadelphia).

pole stood quite 52 degrees above our horizon, and we no longer beheld the stars either of Ursa Minor or Ursa Major; and we were already at a distance of full 500 leagues southeast from the harbor whence we had set out: and this was on the 3d of April: and on that day there arose a tempest of such violence on the sea that we were compelled to haul down all our sails, and we scudded under bare poles before the great wind, which was southwest with enormous waves and a very stormy sky: and so fierce was the tempest that all the fleet was in great dread: the nights were very long: so that on the seventh of April we had a night which was 15 hours long: for the sun was at the end of Aries: and in that region it was winter, as your Magnificence may well consider: and while in this tempest on the seventh of April, we had sight of a new land: along which we ran for about 20 leagues, and found that it was wholly a rough coast: and we beheld therein neither any harbor nor any people, because, as I believe, of the cold which was so intense that no one in our fleet could fortify himself against it nor endure it: inso-much that, finding ourselves in so great a danger and in such a tempest that one ship could hardly see another for the great billows that were running and for the deep gloominess of the weather, we agreed with the chief captain to signal to the fleet to approach and that we should abandon this land: and turn around on the road to Portugal," etc.

In Vespucci's account of his voyages, which he addressed to Lorenzo di Medici, and which was published both in Latin and German,³⁸ Vespucci speaks of having reached the fifty-second degree of south latitude, but he does not mention seeing a new coast. But his letter to Soderini is conclusive.

This discovery does not appear, however, to have attracted much attention at the time. The first notice of it appears to be one in Ruysch's *Ptolemy* of 1508,³⁹

³⁸ I have seen three copies of this narrative of Vespucci:

1. (First leaf) *Von der Neu gefundenê Region die wol ein Welt genennt mag werden: Durch den Christlichen Künig von Portugall wunderbarlich erfunden: Albericus Vespuccius Laurentii Petri Francisci Medicis vil gruess: (Last page) Gedruckt in Nüremberg durch Wolffgang Heuber [1505]: (Kön. Oef. Bib. Dresden).*

2. (First leaf) *Von der neu gefunden Region die wol ein Welt genent mag werden durch den Christlichen Künig von portigal wunderbarlich erfunden: Albericus Vespuccius Laurentio Petri Francisci de Medici vil grüss: [1505]: (Kön. Oef. Bib. Dresden).*

3. Title page wanting. (First page) *Quatuor Americi Vesputii Navigationes: (Last page) Urbs Deodate Finitu 11η KL: Septēbris Anno supra ses quimillesimu vij: (Kön. Oef. Bib. Dresden).* This copy was published by Martin Waldseemüller or Hylacomylus.

About original editions of the writings of Amerigo Vesputius, see the admirable bibliography by Henry Harrisse: *Biblioteca Americana Vetusissima*, New York, Geo. P. Philes, MDCCCLXVI.

³⁹ Ruysch: *Claudii Ptolemaei Geographie*, etc., Rome MDVIII. : (Kön. Oef. Bib. Dresden). One map in this shows Africa extending eastward, south of Mons Lunae, and joining Asia beyond "Aurea Chersonesus": this land is marked "Terra Incognita." The next map shows no such land, but Africa with

where there is an inscription on one of the maps which would seem to refer to the voyage of Vespucci. There is also a short passage in a Spanish work of 1519⁴⁰ which speaks of an austral land in 52° south latitude. The first direct reference I have seen of Vespucci's discovery is on a chart published by Monsieur Buache in 1757.⁴¹ He charts a land in about the position of South Georgia, with the legend "Terre vue par Améric Vespuce."

Several geographers in the nineteenth century examined into this matter. Captain Duperrey⁴² wrote

the Cape of Good Hope, and the "Terra Sancte Crucis, sive Mundus Novus" extending indefinitely towards the south: under this is a legend: "Naute Lusitani partem hanc terre huus observarūt et usque ad elevationem poli antarctici (*sic*) 50 gradum pervenerunt nondum tamen ad eius finem austrinū."

⁴⁰ Enciso, Martin Fernandez de: *Suma de Geographia*, Seville, 1519: (British Museum).

⁴¹ *Histoire de l'Académie Royale des Sciences, avec les Mémoires*, etc., Année MDCCLVII.: A Paris, de l'Imprimerie Royale, M.DCCLXII.: *Mémoires*, pages 190-203:—M. Buache: "Observations géographiques et physiques, ou l'on donne une idée de l'existence de Terres Antarctiques," etc., with two charts: (Bib. Nat. Paris). In addition to Vespucci's landfall, Monsieur Buache marks the Cap de la Circoncision, and also in about the same latitude, the place where he thinks Gonneville landed and lived on a fertile inhabited land. He also charts a large island "Islande" in about the position of the South Shetlands, but without mentioning whom he thinks discovered this place.

⁴² Duperrey, Capitaine L. I.:—*Voyage autour du Monde* * * * *sur la corvette de Sa Majesté La Coquille*, etc., Paris, Arthus Bertrand, 1829, "Hydrographie," page 101: (Acad. Nat. Sci. Philadelphia).

that the land seen by Vespucci must be the one seen by de "la Roche" in 1675, by Duclos Guyot in 1756, and called South Georgia by Cook. Alexander von Humboldt,⁴³ on the contrary, thought that Vespucci must have been driven back by a storm and seen part of the coast of Patagonia. Humboldt knew and quoted Duperrey's remarks, and, on account of Humboldt's great accuracy, his opinion that Vespucci did not reach South Georgia carries much weight. Finally M. de Varnhagen⁴⁴ studied the matter and basing his argument on the course held, the distance run and the length of coast sighted, he showed that most likely the land seen by Vespucci was South Georgia. Dr. Fricker⁴⁵ followed suit, and the writer also subscribes to the opinion that Vespucci's antarctic, or semi antarctic landfall, was probably South Georgia.⁴⁶

For a hundred years after Vespucci, there do not appear to be any antarctic discoveries to chronicle. The knowledge or beliefs respecting the south polar

⁴³ *Examen Critique de l'Histoire de la Géographie du Nouveau Continent*, Paris, Gide, 1839, Tome V, pages 23, 115, 116.

⁴⁴ Varnhagen, F. A. de: *Amerigo Vespucci, son Caractère, ses Ecrits*, etc., Lima, 1865, page 111: (Lib. Co. Philadelphia).

⁴⁵ *The Antarctic Regions*.

⁴⁶ A writer in *The Scottish Geographical Magazine*, Edinburgh, 1898, Vol. XIV., page 388, in a review of Dr. Fricker's *Antarktis*, says: "The discovery of the South Shetlands by Dirk Gerritsz, and of South Georgia by Amerigo Vespucci, will not be generally accepted."

regions, however, may be traced to a certain extent from the maps and charts which have come down to us. Among these, the globes of Johannes Schöner or Schoner,⁴⁷ a German geographer of the first half of

⁴⁷ Globe of 1515 (examples are said to be in Weimar and Frankfurt A. M.), reproduced by Jomard, XVII., and by Wieser. A south land is shown with the name "Brasilie Regio." In connection with this, Schöner published: *Luculentissima quaedam terra totius descriptio*, etc., Noribergæ, Joannis Stuchsen, 1515: (British Museum). On fol. 61 is a sentence, "*Brasiliæ regio. A capite bonæ Spei (quod Itali Capo de bona Speranza vocitant) parum distat. Circûnauigarunt ita³ Portugalien, eam regionum:*" which raises a doubt whether some one had not sailed through the Strait of Magalhaês before 1515.

Globe of 1520: (Germanisches Museum, Nuremberg). This is a splendid piece of early cartography. The south land is shown and is called "Brasilia Inferior." It is separated from the Cape of Good Hope only by a wide strait, through which a ship is sailing.

Globe of 1523. In connection with this, Schöner published: *De Nuper sub Castiliæ ac Portugaliæ Regibus Serenissimis reperi-tis Insulis ac Regionibus, Joannis Schöner Charolipolitani epistola Globus Geographicus*, etc., "Vale Timiripæ, Anno Incarnationis dominicæ Millesimo quingentesimo uigesimotertis": (British Museum). In another binding (British Museum, No. C. 32, m. 11) are two charts in gores. An autograph letter bound with them says they are Schöner's globe of 1523, and that they are presented to the British Museum by Ludwig Rosenthal, Antiquariat, München, 1885. In the middle of each chart is written "Réimpression moderne," and I am inclined to think this statement is correct. There is, however, an undoubted original of this map in the Lenox Library in New York City. One of the parts shows a fair representation of America with the Strait of Magalhaês marked "Sing S. Juliani." The south land is given as lumps of islands. In the other part also there is some land far south of Africa and Asia. The route of Magalhaês is marked. This map is reproduced in Henry Stevens' (of Vermont): *Johann*

the sixteenth century, deserve more than a passing notice, because several writers have stated that he was responsible for starting the idea of the Terra Aus-

Schöner, professor of Mathematics at Nuremberg: A Reproduction of his globe of 1523, long lost: London, Henry Stevens, MDCCCLXXXVIII. A. E. Nordenskjöld (*Facsimile Atlas*, page 80 b.) also reproduces these gores, but doubts their being by Schöner. It seems to me impossible to say at present whether these gores are Schöner's globe of 1523 or not.

Globe of 1533: (Said to be in the Weimar Library: reproduced in Wieser's *Magalhaës Strasse*). The south land is called Terra Australis.

The work of Schöner has been thoroughly examined in Dr. Franz Wieser's excellent book: *Magalhaës Strasse*, etc. Wieser thinks that the globe of 1515 was largely based on the *Copia der Newen Zeytung aus Presillg Land* (Kön.Oef. Bib. Dresden, bound up with *Beschichte Kurtzlich durch die von Portugalien in India, Morenland, und andern erdrich*), which little tract, the first one known to bear the name *Zeytung*, Wieser reprints correctly. F. A. deVarnhagen (*Nouvelles Recherches sur les derniers voyages du navigateur Florentin*, etc., Wien, 1869: Kön. Oef. Bib. Dresden) thinks the *Copia* refers to the ships of Gonçalo Coelho, which were separated from the ship on which was Vespuccius, and that the *Copia* was published in 1507. Dr. Sophus Ruge (*Jahresbericht des Vereins für Erdkunde zu Dresden*, I. Band, IV. and V. Heft, Dresden, 1868, pages 13-27) first thought the *Copia* apocryphal, but later says (*Deutsche Geographische Blätter*, 1895, Band XVIII., pages 147-171) that Dr. Konrad Habler has discovered in the "Fuggerschen Archiv" about the voyage described in the *Copia*, which was printed in 1514. Wieser thinks that the strait in Schöner's 1515 globe was the mouth of the Rio de la Plata or more likely the gulf of Saint Mathias (See A. Petermann's chart, *Mittheilungen, Ergänzungsheft*, 39, Gotha, 1875, "Mapa Original de la Republica Argentina") and this may well be the case, judging from the remarks of the Chev. Pigafetta, (*Premier Voyage autour du monde * * * sur l'escadre de Magellan*, Paris, H. J. Jansen, l'an IX, page 23)

tralis.⁴⁸ This, however, is certainly not the case. Noteworthy as his maps are, especially about the shape of South America and the marking of a strait at the southern end before Magalhaês' voyage, yet they furnish no clue that Schöner thought anything about Vespucci's discovery of, probably, South Georgia; nor that his southern continent was drawn from anything but the traditions of the past.

The earliest map known to give the name of Terra Australis appears to be the one made by Orontius Finaeus in 1531,⁴⁹ which charts "Terra Australis recenter inventa, sed nondû plenê cognita."

From the beginning of the sixteenth century until about the middle of the eighteenth century, maps and

who says of the river in 34° 40' south latitude (the Rio de la Plata): "It was believed formerly that this water was not a river, but a canal, through which one passed into the South Sea; but it was soon found that it was only a river, which is seventeen leagues wide at the mouth."

⁴⁸ Dr. Oscar Peschel: *Geschichte der Erdkunde*, München, 1865, page 327. Dr. Fricker: *The Antarctic Regions*, page 16.

⁴⁹ Published in Simon Grynaeus: *Novus Orbis Regionum ac Insularum*, etc., Paris, 1532: (Two copies in Lenox Lib. New York City). The map is entitled "Nova et integra universi orbis descriptio" by "Orontius F. Delph: 1531, Mense Julio." On the "Terra Australis" south of Asia is "Brasilie Regio" and in about the position of Australia is "Regio Patalis." This map is reproduced in John Boyd Thacher's *The Continent of America*, New York, W. E. Benjamin, 1896: (Lib. Co. Philadelphia); and in A. E. Nordenskjöld's *Facsimile Atlas*, Stockholm, MDCCCLXXXIX, Plate XLI.

globes⁵⁰—in accordance almost surely with how nearly the cartographer drew from the reported facts or depended on the authority of the past—sometimes do

⁵⁰ Juan de la Cosa, companion of Columbus: World Chart, end of XV. century; (Reproduced in Jomard, Plate XVI.). No southern land.

“*Hunt-Lenox globe*” (Lenox Lib. New York City). This shows no trace of a southern land.

Bernardus Sylvanus: *Claudii Ptolemaei Alexandrini Liber Geographiac*, etc., Venetiis, J. Pentium, MDXI.: (Harvard Univ. Lib.; Pub. Lib. Boston). Rough maps, none of which shows a southern land.

Angelo: *Claudii Ptolemei, viri Alexandrini, Geographie*, etc., [Strasburg] MDXIII.: (Kön. Oef. Bib. Dresden). Colored maps: the “*Orbis Typus Universalis*” has no trace of a southern continent.

Joannis Grieninger: *Claudii Ptolemaei * * * opus Geographia*, etc., 1522 [Strasburg]: (Harvard Univ. Lib.). The “*Orbis Typus universalis*” marks the name “*America*”: there is no southern land.

Bilibaldi Pirekheymer, translator: *Claudii Ptolemaei Geographiac*, etc., Strasburg, MDXXV.: (Harvard Univ. Lib.; Pub. Lib. Boston). In the “*Diefert situs orbis Hydrographorum*” no southern land is charted.

Anonymous chart 1527: (Grossherz. Bib. Weimar). Diego Ribero's chart, 1529: (Grossherz. Bib. Weimar). Both these charts mark the Strait of Magalhaës, but neither shows the southern boundary of Tierra del Fuego, nor any antarctic land: they are reproduced in J. G. Kohl's *Die beiden ältesten General Karten von Amerika ausgeführt in den Jahren 1527 und 1529 auf befehl Kaiser Karl's V.*, Weimar, Geographisches Institut, 1860: (Kön. Oef. Bib. Dresden).

Simon Grynaeus: *Novus orbis Regionum* etc., Basilaee, MDXXXII.: (Kön. Oef. Bib. Dresden; Harvard Univ. Lib.). There is no southern land on the world chart.

Simon Grynaeus: *Novus orbis Regionum*, etc., Paris, MDXXXII.: (Pub. Lib. Boston). This copy has the Basel map of 1532.

and sometimes do not show the great "Terra Australis." On most of the earliest maps, until about the time of Schöner, a southern land is outlined; then for

Servetus: *Claudii Ptolemaci Alexandrini geographicae enarrationis libri octo*, etc., Lugduni * * * Trechsel, MDXXXV.: (Harvard Univ. Lib.). The "Tabula Totius Orbis" shows no southern land.

Gerard Mercator: A world chart dated 1538, which was found in one of the above mentioned copies of the Paris *Grynaeus* of 1532 in the Lenox Library, New York City. This map gives much the same outline to the southland as the map of Finaeus, but without the name: it is reproduced in John Boyd Thacher's *The Continent of America*, New York, W. E. Benjamin, 1896.

Servetus: *Claudii Ptolemaci*, etc., Trechsel, Viennae [Dauphiné] MDXLI.: (Harvard Univ. Lib.; Stadt Bib. Frankfurt A. M.). No maps with southern lands.

Gerard Mercator: *Sphère terrestre*, published at Louvain 1541. (Republished Bruxelles, 1875: Harvard Univ. Lib.). This gives the outline of Terra Australis, but without any name.

Alonzo de Santa Cruz's Chart of the world, 1542. (Reproduced in Stockholm, 1892: Harvard Univ. Lib.). Shows Strait of Magalhaens and north shore of Tierra del Fuego, but no antarctic land.

World chart painted on parchment by order of Henri II., King of France, 1542. (Reproduced in Jomard, Plate XIX.). Shows Tierra del Fuego stretching south as a continent extending round the pole: legend "La Terre Australie, non du tout decouverte."

Sebastian Münster: *Geographia Universalis* * * * *Claudii Ptolemaci*, etc., Bale, MDXLII.: (Harvard Univ. Lib.). Highly colored rough maps: no southern land except Tierra del Fuego, which is charted but unnamed in the "Typus Universalis" and the "Novae Insulae XVII Nova Tabula."

Sebastian Cabot's Chart of the world of 1544: (Jomard, Plate XX.). No antarctic land.

Sebastian Münster: *Geographia Universalis* * * * *Claudii Ptolemaci*, etc., Bale, MDXLV.: (Harvard Univ. Lib.). No southern land except Tierra del Fuego, which is charted but un-

about fifty years there is a noticeable falling off in the numbers of maps giving it; while, at the end of the six-

named in the "Typus Universalis" and in the "Novae Insulae XXVI Nova Tabula."

*Geographia universalis * * * Claudii Ptolemaci * * ** Basileae, per Henrichum Petri, MDXLVII.: (Lib. Co. Philadelphia). The "Typus orbis" shows the southern continent extending, according to the ideas of the ancients, from southeast Africa around the Indian Ocean to Asia.

Jacopo Gastaldo: *La Geografia di Claudio Ptolemeo*, etc., Venetia, G. B. Pedrazano, MDXLVIII.: (Harvard Univ. Lib.). The maps "Dell universale nove" and "Carta Marina nova tabula" show no south polar continent; they mark an enlarged Tierra del Fuego, the last of these two maps showing it as a big island.

Demongenet, Franciscus: Gores of a world chart, 1552: (Lenox Lib. New York City). This shows the "Terra Australis nondû plenê cognita" extending across the entire globe.

Simon Grynaeus: *Novus orbis Regionum ac insularum*, etc., Basiliae, MDLV.: (Stadt Bib. Frankfurt A. M.). In the good map "Typus Cosmographicus Universalis," the Antarctic is represented entirely as water.

Girolamo Ruscelli: *La Geografia di Claudio Tolomeo*, etc., Venetia, MDLXI.: (Harvard Univ. Lib.). The "Carta Marina Nuova Tabula" shows Tierra del Fuego as a big island: no south polar continent.

Joseph Moletius: *Geographia Cl. Ptolemaci*, etc., Venetia, MDLXII.: (Harvard Univ. Lib.). The "Orbis Descriptio" shows no south polar continent: the "Carta Marina Nuova Tabula" shows Tierra del Fuego as a big island.

Jeronomo Ruscelli: *La Geografia di Claudio Tolomeo*, etc., Venetia, MDLXIII.: (Harvard Univ. Lib.). The "Carta Marina Nuova Tabula" shows Tierra del Fuego as a big island.

Johannes Praetorius: copper globe, Nuremberg, 1566: (Germanisches Museum, Nuremberg). South land marked as "Brasiliae Regio."

Gerard Mercator: "Mappemonde," Duisbourg, 1569: reproduced in Jomard, Plate XXI. Indicates southern continent, and

teenth century and the beginning of the seventeenth century Terra Australis once more reappears, to die

at one spot has a legend, about land in 42° south latitude, 450 leagues from Cape of Good Hope, and 600 from Cape Saint Augustine, which says that the information is taken from Martin Fernandez de Enciso's *Suma de Geographia*, Seville 1519.

Gio. Malombra : *La Geographia di Claudii Tolomeo*, etc., Venetia, G. Ziletti, MDLXXIII. : (Harvard Univ. Lib.). The "Carta Marina Nuova Tavola" shows Tierra del Fuego as a big island.

Gerard Mercator : *Tabulae Geographicae Claudii Ptolemaei*, etc., MDLXXVIII. : (Harvard Univ. Lib.). Colored maps ; none showing a south polar land.

Abraham Ortelius Antverpianus : *Theatrum Orbis Terrarum* ; (1579) : (Kön. Oef. Bib. Dresden). In the "Typus Orbis Terrarum" the "Terra Australis nondum cognita" stretches across the entire southern regions : it includes Tierra del Fuego and extends up to New Guinea and Java. In the "Americae sive novi orbis" the shape of South America is less accurate than in Schöner's maps and New Guinea is included in the southern continent.

Cornelius Wytfliet Louaniensis : *Descriptionis Ptolemaicae Augmentum*, etc., Louvain, J. Bogardus, MDXCVII. : (Harvard Univ. Lib.). The "Utriusque Hemispherii Deliniatio" shows "Terra Australis" in both hemispheres : "Golfo di San Sebastiano" charted but unnamed.

Abraam Ortelius : *Il Teatro del Mondi*, Brescia, MDXCVIII. : (Harvard Univ. Lib.). The "Typus orbis Terrarum" shows the great "Terra Australis nondum cognita."

W. Jansenius Blaew : *Globe*, 1599 : (Germanisches Museum, Nürnberg). A southern continent is delineated.

Pietro Montanus : *Claudii Ptolemaei Alexandrini Geographiae*, etc., Frâcofurti, 1605 : (Stadt Bib., Frankfurt A. M.). None of the maps shows a south polar continent.

Gerard Hesselius : *Descriptio ac delineatio Geographica Detectionis Freti*, Amsterdam 1613 : (Bib. Johannis Thysii, Leyden). Southern continent inscribed "Terra per Petrum Fernandez de Quir recens detecta," etc.

away slowly in the eighteenth century. It would almost seem as though the recrudescence of charts

John Norton: *An Epitome of Ortelius*, London, [1616]: (Harvard Univ. Lib.). The "Typus Orbis Terrarum" shows the great "Terra Australis nondum cognita," and "The Terrestrial Globe" shows the "Terra Australis Incognita."

Peter Bertius: *Theatri Geographiae veteris * * * Cl. Ptol. Alexandrini*, etc., Lyons, 1618: (Harvard Univ. Lib.). No map showing south polar lands.

Purchas, Samuel: *Hakluytus Posthumus*, etc., London, 1625: (Kön. Oef. Bib. Dresden). In the Third part, page 882, is a map "America Meridionalis" taken from Hondius, which shows Tierra del Fuego as part of "Terra Australis."

Francis Fletcher: *The world encompassed by Sir Francis Drake*, London 1628: (British Museum). The map has "The Southerne unknowne Land" and "This south part of the world (containing almost the third part of the Globe) is yet unknowne certayne few coasts excepted: which rather shew there is a land than discry eyther land, people or commodities."

Blaeu, Wilhelm and Johann: *Tonneel der Aerdrich oste Nieuwe Atlas*, Amsterdam [About 1635]: (Harvard Univ. Lib.). The "Nova totius Terrarum" shows the great "Terra Australis Incognita."

de Wit, Frederick: *Atlas*, Amsterdam [About 1666]: (Harvard Univ. Lib.). The "Nova Orbis Tabula" has no southern land: inscribed at bottom "Australia Incognita."

du Val, P., géographe ordinaire du Roy: *Cartes de Géographie*, Paris, MD.C.LXXVIII.: (Harvard Univ. Lib.). The "Planisphère, 1676" shows great southern continent marked "Terres Antarctiques" and "Terres Australes Inconnues."

Sanson, Dr.: *Atlas Nouveau* [About 1690]: (Harvard Univ. Lib.). The "Mappemonde" shows "Terre Australe et Inconnue," but smaller than earlier maps.

de l'Isle, Guillaume: *Atlas*, Amsterdam, Jean Covens and Corneille Mortier [About 1710]: (Harvard Univ. Lib.). The "Hémisphère méridional" shows no south polar continent: this is the first map specially of the Antarctic, which I have seen in an atlas.

about the year 1600, showing a great land extending south of New Guinea, pointed towards early sightings of the coast of Australia.⁵¹ It is almost certain that a sailor, Juan Fernandez, in about 1563, reached the island which bears his name; and there is also a sort of legend, that in about 1576, he may have

Moll, Herman: *A new and correct map of the world*, London 1719: (Harvard Univ. Lib.). No antarctic land.

Moll, Herman: *A new and correct map of the world*, London [About 1735]: (Harvard Univ. Lib.). No antarctic land.

A Collection of Voyages and Travels, London, T. Osborne, MDCCXLV., Vol. I.:—H. Moll: "A New Map of the World" etc.: (Amer. Phil. Soc.). No antarctic land.

Lowitz, M. G. M.: "Mappemonde, 1746": In an atlas: (Harvard Univ. Lib.). Taken from the "Cartes générales" of Professor Hadius. No great antarctic land on this map, which gives the "Cap de la Circoncision" and "I. de la Roche," the latter in about 45° south latitude.

Palairat, Jean: *Atlas Méthodique*, 1755: (Harvard Univ. Lib.). "3e mappemonde, 1755" shows no southern land except "C. de la Circoncision."

Unknown author: *Mappe-Monde divisée en ses quatre parties 1759*: (Amer. Phil. Soc.). This marks "Terre vue par F. Drak" in about 62° to 63° south latitude, somewhat west of Cape Hoorn.

⁵¹ Mr. R. H. Major (*Early Voyages to Terra Australis, now called Australia*, London * * * Hakluyt Society, MDCCCLIX.) gives it as his opinion that some Portuguese mariners probably saw a good deal of the coast of Australia between 1512 and 1542; and he cites six maps, the latest drawn in 1555, in support of his view, which is probably correct.

Professor Morris (*Transactions of the Royal Geographical Society of Australasia, Victoria*, Melbourne, Vol. XVI., 1898, pages 15-27: "Terra Australis Incognita") seems inclined to believe that the early maps showing land in the position of Australia were drawn from imagination.

reached the coast of New Zealand⁵² and certainly the maps of the succeeding period would seem to point to some such discovery. Another noteworthy fact is that several maps of the middle of the sixteenth century, some thirty years before the voyage of Drake and some sixty years before the voyage of LeMaire, show Tierra del Fuego as an enlarged island.⁵³

On the 27th of June, 1598, a squadron of five ships sailed from Goree Harbor, Holland, for the West Indies.⁵⁴ They were "de Hoope," Admiral Jaques Mahu, pilot William Adams; "de Liefde," Vice

⁵² Burney, James, Captain in the Royal Navy: *A Chronological History of the Voyages and Discoveries in the South Sea or Pacific Ocean*, London, Vol. I., 1803, pages 274; 300-303: (Lib. Co., Philadelphia).

⁵³ The early charts showing Tierra del Fuego as an island are probably based on the voyage of Captain Francisco de Hoces, who commanded the caravel "S. Lesmes" of 80 tons, in the expedition of Fr. Garcia Jofre de Loaysa or Loaisa (Navarrette, Martin Fernandez de: *Coleccion de los Viages y Descubrimientos*, Tomo V, Madrid 1837, pages 27, 28, 404: Amer. Phil. Soc.). In February, 1526, Hoces ran down the east coast of South America, and turned back after he had seen that the land finished in 55° south latitude: he may have reached Cape Hoorn, but it is more likely that his farthest point was the eastern end of Staaten Land.

⁵⁴ Bry, Theodori de: *Americae; Nona & Postrema pars*; Francof., Apud Matth. Beckerum., 1602: "Vera et accurata descriptio eorum omnium, quae acciderunt quinque navibus Anno 1598, Amstredami expeditis & per fretum Magellanicum ad Moluccanas insulas perrecturis: navi praecipue Fidei, Capitano de VVeert addicta qui post infinitos labores & aerumnas biennio integro tolerates, tandem anno 1600, re infecta ad suos rediit": (Lib. Co. Philadelphia).

Admiral Simon de Cordes; "het Gheloove," G. Van Benningen; "de Trouvve," J. van Bockholt; and "de Blijde Booschap," Sebald de Wirt.

Jansz, Barent, Chirurgijn: *Historisch ende Wijdtloopigh verhael van 'tghene de vijf schepen (die int Jaer 1698 [1598] tot Rotterdam toegherust zijn om door de Straet Magellana haren handel te dryven) wedervaren is tot den 7 Septemler 1599*, etc.; Tot Amstelredam by Michiel Colijn, etc., 1617: (Kon. Bib. The Hague). There is an earlier edition of Jansz' narrative, and this I have not seen.

Beschryvinghe van de Voyagie om den geheelen Werelt Cloot ghedaen door Olivier van Noort van Verecht, Generael over vier Schepen, etc.; Amstelredam, by Cornelis Claesz [1602]: (Univ. Bib., Leyden).

Herrera, Antoine de, Grand Chroniqueur des Indes et Chroniqueur de Castille: *Description des Indes Occidentales, qu' on appelle aujourd'hui le Nouveau Monde, Translatée d'Espagnol en François*; A Amsterdam, chez Michel Colin, Anno M.D.C.XXII.: pages 179-195, "Recueil des Navigations de l'Estroit de Magellan," pages 189-193, "Voyages de cinq bateaux de Jaques Mahu et Simon de Cordes, qui partirent de Rotterdam, l'an 1598, pour l'Estroit de Magellan": (Amer. Geog. Soc.).

Herrera, Antonio de: *Novus Orbis, Sive Descriptio Indiae Occidentalis*; Amstelodami, Apud Michaellem Bibliopolam, M. D.C.XXII.: (Lib. Co. Philadelphia.).

[A de Herrera] *Nieuve Welt, anders ghenaeempt West Indien*; t'Amsterdam, Michiel Colijn, 1622: (Kon. Bib. The Hague).

Brosses, Charles de: *Histoire des Navigations aux Terres Australes*; A Paris, chez Durand, M.D.CCLVI.: Tome Premier, pages 274-294, "Simon de Cordes et Sebald de Weert: En Magellanique": (Amer. Geog. Soc.; Pub. Lib. Boston).

Burney: *A Chronological History*, etc., London, 1806: Part II., Chapter XII., pages 186-204: "Voyage of Five Ships of Rotterdam, under the command of Jacob Mahu, and Simon de Cordes, to the South Sea": (Lib. Co. Philadelphia.).

Wichmann, Dr. Arthur, Professor an der Universität Utrecht: *Dirck Gerritsz, Ein Beitrag zur Entdeckungsgeschichte des 16^{ten} und 17^{ten} Jahrhunderts*, Groningen, J. B. Wolters, 1899.

The expedition met with trouble from the start and was one of the most disastrous on record. The general or admiral, Jaques Mahu, died on the 24th or 27th of September, and this involved some changes among the officers. Sebald de Wirt became commander of "het Gheloove" and a pilot or boatswain, Dirck Gerritsz,⁵⁵ was appointed commander of "de Blijde Boetschap." The fleet entered the Strait of Magalhaens⁵⁶ on April 6th, 1599, and spent most of the southern winter in la Baye Verte⁵⁷ or Cordes Bay⁵⁸ "where they were miserably lodged."⁵⁹ On the 4th of September, 1599, the ships reached the Pacific, and three days later, on account of a furious storm, the ships parted company. "Het Gheloove" eventually returned to Europe. "De Hoope" and "de Liefde" reached Japan and are then lost sight of. The pilot William Adams, was ordered by the Emperor to come to Osaca. He did so and the Emperor never would

⁵⁵ Gerritsz's name is spelled in a variety of ways. In de Bry it is given as "Dirrick Gerritsz" and also "Dierick Geeritsz." Dr. Wichmann asserts that "Dirck Gerritsz" is the correct spelling: he has also discovered that Gerritsz was the first Hollander who, as early at least as 1585, reached China and Japan.

⁵⁶ I quite agree with Captain James Burney (*A Chronological History*, etc., Vol. I., page 13) in thinking it a "strange practice" to alter and translate proper names. The correct orthography of the name of Fernão de Magalhaens should be restored to the strait so justly called after him.

⁵⁷ Herrera.

⁵⁸ Burney.

⁵⁹ Herrera.

let him depart, and, after marrying a Japanese woman, Adams lived the remainder of his days in Japan. "De Trouwve" was captured by the Portuguese. "De Blijde Booschap," after having its name changed to "het Vligend Hart," was surrendered to the Spaniards.⁶⁰

Barent Jansz in his narrative mentions Gerritsz several times. He also gives a description of the "penguins" of Tierra del Fuego⁶¹ with a woodcut of penguin hunting, and this is one of the earliest accounts of this antarctic bird. In Van Noort's relation,⁶² Gerritsz is reported to have missed the island of Santa Maria, and then to have arrived at Valparaiso in a miserable condition. None of these earliest accounts, however—and this is an important fact—make any mention of an antarctic discovery.

In 1622, however, Herrera's *Description des Indes Occidentales* appeared at Amsterdam in French, Latin and Dutch editions. In these reprints a passage was intercalated, that does not seem to have appeared in the earlier Spanish edition, and which was, therefore, probably not due to Herrera himself. This paragraph⁶³ says that the ship commanded by Dirck Gerritsz was

⁶⁰ This account of the fate of the ships is taken from Burney and Wichmann.

⁶¹ *Historisch ende Wijdloopigh*, etc., pages 68–70.

⁶² *Beschryvinghe van de Voyagie*, etc., page 37.

⁶³ The French edition of Herrera, page 193, says: "La Fuste de *Diric Gherrits* qui s'estoit esgaree le 15 Septembre des autres, scavoit de *VVert & Cordes*, fut portee par la tempeste jusques' a

separated from the rest of the fleet on coming out of the Strait of Magalhaës and that it was carried by tempestuous weather to 64° south latitude, where they discovered land, with high mountains, covered with snow, resembling the land of Norway and stretching away in the direction of the Solomon Islands.

Many subsequent writers gave more or less elaborate notices about Gerritsz, and among them may be

64. degrés au Sud de l'Estroit : ou ils descouvrirent un haut pays avec des montagnes pleines de neige a la façon du pays de *Norveghen* : d'icy ils firent voile vers *Chile* en intention d'aller trouver leurs compagnons en l'île de *S. Marie* : mais ils furent portés par fortune au port de *S. Jago de Valparayso* ; ou ils furent accablés des ennemis."

The Latin version, folio 80, is as follows : " Liburnica que Theodorum Gerardi vehebat, tempestatum vi versus Austrum propulsa fuit ad gradus usque 64. in qua altitudine posita ad Australem plagam solum monto sum & nivibus opertum eminus conspexit, qualis Norvegiæ esse solet facies. Versus insulas Salomonis exporrigi videbatur. Hinc Chilam petijt & ab insula S. Mariæ quo loci socios se repertutum putabat, aberrans, in portum S. Jacobi de val Parayso se recepit & cum humanitatis ac benevolentiae officia omnia negarent indigenæ, itinere longo confectis vectoribus & commeatus indiga, in hostium manus se dedit."

The Dutch edition, folio 82, gives the following account : " Door alle dese contrarie winden ist apparent dat Dirck Gerritsz die ghebreck aen sijn Boeck-Spriet en Fockemast hadde soo verre suytwaerts is ghedreven, namelick op vier en tsestich graden befunden de Straet op die hoochte wesende sach int Suyden leggen heel hooch Berchachtich landt vol Suceus als het Landt van Norvveghen heel wit bedeckt, en strecktede hem als op het nae de Eylanden van Salomon wilde loopen, van hier is hy nae Chili ghelooopen, ende het Eylant van St. Maria missende, al waer hy sijn gheselschap meynde te vinden is inde Haven van S. Jago, te Val Parayso aenghecomen, en gheen vrientschap vindende machteeloos zijnde is in de handen van sijn vranden moeten vallen."

cited: Purchas;⁶⁴ De Brosses;⁶⁵ Dalrymple;⁶⁶ Burney;⁶⁷ Duperrey;⁶⁸ John Barrow, F. R. S. and Vice President of the Royal Geographical Society;⁶⁹ Dr. Webster;⁷⁰ Dumont-D'Urville;⁷¹ John Lothrop Motley;⁷² G. Neumayer;⁷³ A. Schück;⁷⁴ Sir Clements R. Markham;⁷⁵ L. Friederichsen;⁷⁶ the present writer himself;⁷⁷ and finally

⁶⁴ Purchas, Samuel, B. D. : *Hakluytus Posthumus or Purchas His Pilgrimes*; imprinted at London for Henry Featherston, 1625; Fourth Part, page 1391, note: (Kön. Oef. Bib. Dresden).

⁶⁵ *Histoire des Navigations*, etc., Vol. I., page 290.

⁶⁶ Dalrymple, Alexander: *A Historical Collection of the several voyages and discoveries in the South Pacific Ocean*; London, MDCCLXX., Vol. I., page 94; MDCCLXXI., Vol. II., page 19: (Bib. Nat. Paris; Kön. Oef. Bib. Dresden).

⁶⁷ *A Chronological History*, etc., Vol. II., pages 198, 204.

⁶⁸ Duperrey, Capitaine L. I. : *Voyage autour du Monde * * * sur la corvette de Sa Majesté La Coquille*, Paris, Bertrand, 1829, "Hydrographie," page 102.

⁶⁹ *The Journal of the Royal Geographical Society of London* for MDCCCXXX-XXXI. ; London, MDCCCXXXI., page 62.

⁷⁰ *Narrative of a Voyage*, etc., Vol. I., page 136.

⁷¹ *Voyage au Pôle Sud*, etc., Vol. II., pages 1, 2.

⁷² *The United Netherlands*, Chapter XXXVI.

⁷³ *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Siebenter Band, 1872, page 124.

⁷⁴ *Zeitschrift für wissenschaftliche Geographie*, Weimar, 1888; VI., pages 242-264 "Entwicklung unserer Kenntniss der Länder im Süden von Amerika."

⁷⁵ *Encyclopædia Britannica*, Ninth Edition; Article "Polar Regions."

⁷⁶ *Mittheilungen der Geographischen Gesellschaft in Hamburg*, 1891-92; Hamburg, 1895; pages 299-305, "Begleitworte zur Karte des Dirck Gherritz Archipels."

⁷⁷ *Journal of the Franklin Institute*, 1901, Vol. CLI., pages 243-247.

again Sir Clements R. Markham.⁷⁸ Belief in Gerritsz's discovery may, therefore, be considered as having been generally accepted, and in fact we find the name "Gherritz Land" in use by Burney as early as 1806, while in the last few years, the name "Gherritz Archipelago" has been applied to the southern portion of West Antarctica by A. Schück, L. Friederichsen, *Petermann's Mitteilungen*, Ant. Mensing,⁷⁹ Dr. Fricker and others.

It turns out, however, that everything believed of Gerritsz is more or less uncertain and incorrect. Starting apparently from a reference in a book by J. K. J. de Jonge,⁸⁰ Dr. Sophus Ruge⁸¹ probably was the first to throw doubts on the discovery of Gerritsz, and he was followed by Dr. Wichmann⁸² in his masterly treatise.

In the "Rijksarchief" at the Hague there is a manu-

⁷⁸ *Geographical Journal*, London, 1901, Vol. XVIII., page 21.

⁷⁹ *Caerte vande Reysen ende Handel der Hollanders*, Amsterdam, Frederik Muller & Co.; "Samengesteld door Ant. Mensing; Uytgegeven door de Commissie voor Oudt-Hollandt te Amsteldam 1895": (Harvard Univ. Lib.). This marks "Dirk Gherritsz Archipel, 1599".

⁸⁰ de Jonge, Jhr. Mr. J. K. J.: *De Opkomst van het nederlandsch Gezag in Oost-Indie*, s'Gravenhage, Amsterdam, MDCCCLXIV.; Vol. II., page 219: (Univ. Bib. Amsterdam).

⁸¹ *Deutsche Geographische Blätter*, Bremen, 1895, XVIII., pages 147-171; "Das unbekannte Südländ": (Univ. Bib. Amsterdam).

⁸² *Dirck Gerritsz*, etc.

script⁸³ which contains copies of the "Instructions" prepared for Admiral Jacques l'Hermite and which were not published in the account of his journey.⁸⁴ The manuscript is old and was written probably about the end of the seventeenth century. Among the "Instructions" are two documents of great importance in the history of Antarctic discovery. The first is the "Declaration of Jacob Direxz of Purmerlant," a companion of Gerritsz. The first paragraphs read thus:

"Declaration of Jacob Direxz of Purmerlant,⁸⁵ aged 30 years, made on the 17th of March 1603.

⁸³ The title of this manuscript is: *Instructien en Journaalen van Brasiliaansche en Oostindische Rysen. Zaedert 21 April 1623 tot 28 Augustus 1681, behoorende tot het archief der Westindische Compagnie.* Part of this book consists of the "Bijlagen tot de Instructie voor Jacques l'Hermijte." I was able to see this book and have copies made of parts of it, through the kindness of Mr. J. Bruggeman, "Adjunct Commis" in the "Rijksarchief" at the Hague.

⁸⁴ *Journal van de Nassausche Vloot, ofte Beschrijvingh van de Voyagie om den gantschen Aerdt-Cloot, ghedann met elf Schippen: on der' t beleyd van den Admirael Jaques l'Heremite, ende Vice Admirael Geen Huygen Schapenham, inde Jahren 1623, 1624, 1625 & 1626; T Amstelredam, by Hessel Gerritz ende Jacob Pietersz wachten 1626: (Bib. Johannis Thysii, Leyden).*

Another edition: *Journal van de Nassausche Vloot, etc., Amstelredam, voor Joost Hartgertsz * * * Anno 1648.*

⁸⁵ *Instructien en Journaalen, etc., "Bijlagen," etc., folio 43.*

"Verclaringe van Jacob Direxz van Purmerlant out zijnde 30 jaren, gedaen den 17^{en} Martii 1603.

"Den deposant is geweest constapel op het Vliegende Hart, ende op het laetste onderstierman.

“The attester was gunner on the ‘Vliegende Hart’ and finally under-pilot.

“On the 4th of September 1599, they ran out of the Strait of Magalhaens into the South Sea, on the third day thereafter they were separated by a great storm from the other ships, came three times to within 50 degrees, and were driven twice to 55 degrees and once to 56 degrees.

“From there they came to the Island of Chiloe in 44 degrees, and then came to the Island of St. Maria, which is situated at the heighth of 37 degrees, which they considered was La Mocha, from there they came to the heighth of 35 degrees, where they thought to find the island of St. Maria, and all this on account of the English sea charts.

“Den 4 September 1599 liepen uijt de Magallanische straet in Mar del Zur, op den derden dach daer naer wierden met een grooten storm van d'ander schepen versteecken, quamen tot driemalen toe binnen den 50 graet, ende wierden tweemaal op 55 graden, ende eenmaal op 56 graden gedreven.

“Van daer quamen zij bij het eylant van Chilue op 44 graden, ende daer quamen zij aent eylant van St. Maria, zijnde gelegen op de hoochte van 37 graden, welcke zij meenden te wesen La Moche, van daer zijn zij gecomen op de hoochte van 35 graden, alwaer zij meijnden het eylant van St. Maria te vinden, ende dat alles volgens hunne Engelsche zee-carten.

“Van daer seijden zij in de haven van Valpareise, sijnde gelegen op 32 graden ende 36 minuten, alwaer zij te lande comende soo wiert hun capiteijn Direk Gerritsz, ende hij Jacob Direxe, ende de provoost gequetst van de Spaignaerden, aldaer wonende, twelek geschiede den 17 November 1599. Direk Gerritsz hun schipper zijnde half broeder van hun capiteijn, starff in de navolgende nacht, soo zij gecomen waren in Valpareise,” etc.

“From there they sailed to the harbor of Valparaiso, which lies in 32 degrees 36 minutes, where, when they went ashore, their Captain, Dirck Gerritsz, and himself, Jacob Dircksz, and the provost, were wounded by the Spaniards, which happened on the 17th of November 1599. Dirck Gerritsz, their ship-master and half brother of the captain, died in the following night,” etc.

The rest of the declaration is taken up with an account of the stay of Dircksz among the Spaniards and with notes about the country; the quoted portion, however, is almost conclusive evidence that Gerritsz did not cross the 60th parallel of south latitude, and, therefore, that he did not discover land in the Antarctic. It may be well to add that this document is the only account known by any member of the crew of “de Blijde Boetschap” which has come down to us and that there is no line of writing or print in existence which can be attributed to Gerritsz himself.

The other document, however, states that a ship did reach 64° south latitude. This is in the same binding⁸⁶ and the beginning reads as follows: “Laurens Claess of Antwerp, aged about 40 years,

⁸⁶ *Instructien en Journaalen*, etc., “Bijlagen,” etc., folio 23.

“Laurens Claess van Antwerpen, out ontrent 40 jaren, hebbende voor hoochbootsman op het Magellanische Schip, genaemt De blijde boetschap, is neffens andere schepen uijt het Goederesche Gadt gelopen op St. Jans avont 1598 onder den Admiral Mahu, heeft gevaren onder den Admirael Don Gabriel de Castiglio met drie schepen langs de custen van Gilo naer Valparaiso,

has served as boatswain on the Magalhaês ship, called de Blijde bootſchap, which ſailed with other ſhips from the harbor of Goree on Saint Johns day of the year 1598 under Admiral Mahu, has ſerved under the Admiral Don Gabriel de Caſtiglio with three ſhips along the coaſt of Chili towards Valparaïſo, and from there towards the Strait, and that in the year 1603, and he went in March to 64 degrees where they had much ſnow, in the following month of April they returned to the coaſt of Chili," etc.

This appears to be the firſt direct record of a ſhip crossing the ſixtieth parallel of ſouth latitude and it ſeems that it was a Spaniſh ſhip. It is much to be hoped that further records of this voyage and of Don Gabriel de Caſtiglio may yet be found: perhaps there are ſome ſtill buried among the Spaniſh archives.

It will be noticed that Laurens Claess ſays nothing of land nor of high mountains in the Antarctic. Dr. Ruge and Dr. Wichmann both appear to think, there-

ende van daer naer Strate, ende dat in den jare 1603, ende is geweest in Martio op 64 graden, aldaer hadden zij veel sneeus, in de volgende maent April zijn zij weder gekeert aen de custe van Gilo, heeft met zijn heere den bisschop van Einto Don Fraij Louis Lopes de Soles Augustini aender, Don Pedro Sordes de Ouleau, gevaren anno 1604 naer Iselos Cognitas, sijn drie int getal, het eerste genaemt St. Nicolaes de Tolentine, het tweede St. Veronica ende het derde St. Antonio de Padua, welke zijn gelegen op de zuijdelijcke hoochte van 4 graden 400 mijlen van de custe van Peru naer de gissinge van de Spaignaerden, ende naer zijn gissinge ontrent 300 Spaensche mijlen, leggen seer nae bij oost ende west van malcanderen, van het eerste tot het tweede zijn acht glasens seijlens. * * * " etc.

fore, that there was no land discovered, and of course there may not have been on that particular journey. But this only deepens the mystery. For although the passage in Herrera is doubtless incorrect in ascribing the discovery to Gerritsz, still there is no getting round the fact that a statement was published in Amsterdam in 1622 in three languages, saying that there was land in 64° south latitude, about south of Cape Hoorn, and that it was mountainous and resembled the coast of Norway. And a mountainous land is there and it does resemble the coast of Norway: in fact the first thought suggested to the writer on seeing Dr. Frederick A. Cook's photographs of Palmer Land and Danco Land was how much those coasts resembled the northern coast of Norway and the Lofoten Islands in the early spring before the winter snow had all melted away from the edge of the fiords. While we may never be sure of the name of the discoverer, yet it seems as if it must be accepted as true that some one sighted some of the islands of West Antarctica before the year 1622.

There do not seem to be any maps of the seventeenth century marking any lands as discovered by Gerritsz, Claess or Castiglio. On some old maps, however, is charted,⁸⁷ east and south of Tierra del

⁸⁷ Abraham Ortelius Antverpianus: *Theatrum Orbis Terrarum*, Antwerp, MDLXX. : (Amer. Phil. Soc. ; Pub. Lib. Boston). Maps colored. The "Typus orbis Terrarum" shows "Terra Australis nondum cognita." The "Americae sive novi

Fuego, a land with a great gulf, the "Golfo de San Sebastiano" and an island, the "Ysola de Cressalina."

orbis" shows "Golfo de S. Sebastiano" about thirty degrees of longitude east of the Strait of Magalhaens, and extending to about 64° south latitude. An island there, in 59° south latitude, is marked "Cressalina."

Io. Antonio Magini: *Geographiae universae tum veteris* * * * *Cl. Ptolemaei*, etc., 1597: (Harvard Univ. Lib.). The "Orbis Terrae Compendiosa Descriptio" shows "Terra Australis" in both hemispheres: the "Y. de Cressalina" is marked. The "Universi Orbis Descriptio ad Usus Navigantium" gives the "Terra Australis Nondum Cognita" and marks the "Golfo de S. Sebastiano."

Gio. Antonio Magini: *Geografia cioe' descriptione* * * * *di Cl. Tolomeo*, etc., Venetia, MDXCVIII.: also *La Seconda Parte della Geografia di Cl. Tolomeo*, Venetia, MDXCVII.: (Harvard Univ. Lib.: Lib. Co., Philadelphia). The "Orbis Terrae Compendiosa Descriptio" gives the great "Terra Australis," with the "Y. de Cressalina."

Joan Antonio Magini: *Geographiae universae tum veteris* * * * *Cl. Ptolemaei* etc., 1608: (Harvard Univ. Lib.). The "Orbis Terrae Compendiosa Descriptio" gives the "Terra Australis," with "Y. de Cressalina."

Gerardi Mercatoris Atlas sive Cosmographicae etc., Henrici Hondij, Amsterodami, 1630: (Stadt Bib. Frankfurt A. M.). The "America" shows the "Terra Australis Nondum Cognita." The "Orbis Terrae," dated MDLXXXVII., also shows the "Terra Australis": on this, west of the Cape of Good Hope, in about 48° south latitude, a place is marked "Promontorii Terre Australis distans 450 leucas a Capite Bone Spei & 600 a promontorio S. Augustini": eastward of the Strait of "Magellanes" a land in about 54° south latitude is marked "Ysola de Cressalina."

Dalrymple, Alexander: *A Historical Collection* * * * *South Pacific Ocean*, London, Vol. I., MDCCCLXX.: (Bib. Nat. Paris). In the map of the Antarctic, there is charted, east and south of Tierra del Fuego, a land with a great gulf.

It has been suggested that they were either Sandwich Land or South Shetland.⁸⁸ Possibly this is true and if so they must have been seen by some now entirely forgotten mariner, as there is no known record showing that they were drawn from anything but imagination. At any rate they have nothing to do with Gerritsz, Claess or Castiglio, for they are charted at least as early as 1570, and from then on to 1770.

We find Pedro Fernandez de Queros next seeking for a *Tierra Austral* in 1605.⁸⁹ His able second in command, Luis Vaez de Torres, sighted in 1606, an extended coast south of New Guinea. The same land was seen also that year by a Dutch vessel. In 1616, Theodoric Hertoge, in the *Eendracht*, also sighted another part of this land; and the voyage of Abel Tasman⁹⁰ may be looked on as the last step in the discovery of the land, which was at first supposed to be the one sought for, and which eventually received the name of Australia.

The belief that Tierra del Fuego extended without interruption to the regions of eternal ice was settled

⁸⁸ J. Miers: *Journal des voyages, découvertes et navigations modernes*, par J. T. Verneur, Tome Dixième, Paris, Colnet, 1821, pages 5-24.

⁸⁹ Burney: *A Chronological History*, etc., Vol. II., pages 272, 313, 456.

⁹⁰ *Abel Janszoon Tasman Journal*, Amsterdam, Frederik Muller & Co., 1898: (Lib. Co., Philadelphia).

by the voyage round the world of the Dutchmen, Le Maire and Schouten, in 1616, when they sailed round South America and christened Cape "Hoorn."⁹¹ Although not an antarctic voyage, yet it has a place in the history of antarctic discovery because it narrowed the limits of Terra Australis Incognita.⁹²

In 1643, Hendrick Brouwer's squadron sailed around Staaten Land, because the wind was unfavorable to pass Strait Le Maire.⁹³ This voyage also tended to a narrowing of the limits of Terra Australis Incognita.

⁹¹ *Oost ende West-Indische Spieghele waer in beschreven werden de twee laetste Navigatien. * * * De eene door den vermaerden Zeeheldt Joris van Spilbergen * * * De andere ghedaen by Jacob Le Maire*; Amsterdam, Jan Janssz, MDCXXI.: (Kon. Bib. The Hague). Another edition of this book, published at Zutphen, M.D.C.XXI.: (Univ. Bib. Amsterdam). The "Nova Totius Orbis Terrarum" in both these books shows Staaten Land expanding into a great "Terra Australis Incognita."

Herrera: *Description des Indes Occidentales*, etc., Amsterdam, M.D.C.XXII., pages 105-174: "Journal & Miroir de la Navigation Australe du vaillant bien renommé Seigneur Jaques Le Maire; Chef et conducteur de deux navires Concorde et Horne".

Burney: *A Chronological History*, etc., Vol. II., pages 354-452.

⁹² Three atlases of Mercator of this date show the change brought about by Le Maire's voyage: 1, *Gerardi Mercatoris et J. Hondii Atlas*, Amsterdam, Johan Jansson and Henricus Hondius, MDCXXXIII.: (Kön. Oef. Bib. Dresden). 2, *Gerardi Mercatoris Atlantis Novi*; Henrici Hondij, Amsterodami, 1638: (Kön. Oef. Bib. Dresden). 3, *Gerardi Mercatoris et J. Hondii Atlas Novus*; Amstelodami; apud Henricum Hondium et Joannem Janssonium, 1638: (Kön. Oef. Bib. Dresden). These all have the great Terra Australis, with Staaten Land as part of the antarctic coast.

⁹³ Burney: *A Chronological History*, etc., Vol. III., pages 115, 145.

In 1675, Antonio de la Roché,⁹¹ an English merchant, on a return voyage from Peru, was unable to sail, on account of high winds and strong currents, through the Strait of Magalhaês or Strait Le Maire. He was driven out to sea eastward of Staaten Land and in April 1675, sighted a coast or one or more islands, which the Spanish writer, Seixas y Lovera, places in 55° south latitude. There is little doubt that this was South Georgia.

Captain Bartholomew Sharp⁹⁵ commanded an expedition of Buccaneers to the South Sea in the years

⁹¹ Seixas y Lovera, El Capitan Don Francisco de : *Descripcion Geographica y Derrotero de la Region Austral Magallanica* ; Madrid 1690 ; *Capítulo III., Título XIX.* : (British Museum). Lovera says he drew his material from a pamphlet privately printed in 1678. He mentions the unknown land several times : " que desde 50. a 55. grados ponen la Costa Austral de la Tierra Incognita, empeçan do desde la alture de 45. grados noste Sur, cô el Cabo de Buena Esperança, descayendo la Costa hasta la Aumentacion de los dichos 55. grados ázia el Polo Antartico."

Dalrymple, Alexander : *A Collection of Voyages chiefly in the Southern Atlantick Ocean* ; London, 1775, pages 85-88 : " Extract from the Geographical Description of Terra Magallanica " etc., " Of the discovery which Antonio de la Roché made of another new passage from the No. Sea to the So. Sea."

Burney : *A Chronological History*, etc., Vol. III., pages 395-404.

⁹⁵ Hacke, Captain William : *A Collection of Original Voyages*, London, James Knapton, 1699 : " II, Captain Sharp's Journey over the Isthmus of Darien, and expedition into the South Seas, written by himself " : (British Museum).

A Collection of Voyages, London, James and John Knapton, M.DCC.XXIX. Vol. IV. ; " III, Captain Sharp's Journey of his Expedition," page 82 : (Univ. Bib. Leyden).

1680 and 1681. On his return he sailed round Cape Hoorn in January, 1681. All he says is: "To conclude therefore the whole, I shall only tell you, that after I had sailed near 60 Deg. S. Lat., and as far, if not farther, than any before me, I arrived on the 30th of January at Nevis, from whence in some time I got passage for England."

Captain Cowley⁹⁶ sailed round the world in 1683-1685, and passed outside of Staaten Land in January 1684. "Then haling away S. W. we came abreast with Cape Horn the 14th Day of February, where we chusing of Valentines, and discoursing of the Intrigues of Women, there arose a prodigious storm, which did continue till the last day of the month, driving us into the Lat. of 60 Deg. and 30 min. South, which is further than ever any ship hath sailed before South; so that we concluded the discoursing of women at sea was very unlucky and caused the storm.

"Towards the beginning of the month of March, the wind coming up at South, we were soon carried into warm weather again; for the weather in the lat. of 60 Deg. was so extreme cold that we could bear

⁹⁶ Hacke, Captain William: *A Collection of Original Voyages*, London, James Knapton, 1699: "I, Capt. Cowley's voyage round the globe": (British Museum).

A Collection of Voyages, London, James and John Knapton, M.DCC.XXIX, Vol. IV.: "II, Captain Cowley's Voyage around the Globe": (Univ. Bib. Leyden).

drinking 3 quarts of Brandy in 24 hours each man, and be not at all the worse for it, provided it were burnt."

Captain Edward Davis and Lionel Wafer,⁹⁷ passed around Cape Hoorn, sailing eastward, in December 1687 and January 1688. Wafer says they went to 62° 45' south latitude on Christmas day, 1687; that they saw some tremendous ice islands and that "from these Hills of Ice came very cold Blasts of Wind." He adds that clouds kept "the Sun and Stars so obscured that we could take no Observation of our Lat. yet, by our Reckoning, we were in very near 63 Deg. S. Lat." This seems to have been well east of Cape Hoorn, as when they returned further north, they had to run four hundred and fifty leagues westward, in order to reach South America.

Woode Rogers⁹⁸ "left Bristol the 2d of August 1708. The 10th of January of the next year, they

⁹⁷ Wafer, Lionel: *A New Voyage and Description of the Isthmus of America*, London, James Knapton, 1699, pages 216-220: (Lib. Co. Philadelphia).

B. [Behrens] Monsieur de: *Histoire de l'expédition de trois vaisseaux*; A la Haye, aux dépens de la Compagnie, M.D.CC.-XXXIX.

DeBrosses, Charles: *Histoire des navigations aux Terres Australes*, A Paris, chez Durand, M.DCC.LVI., Tome II., "Lionel Waffer en Magellanique," pages 102-103.

⁹⁸ De Brosses, Charles: *Histoire des navigations aux Terres Australes*, A Paris, chez Durand, MDCC.LVI., Tome II., "Wodes Roggers, en Polynesie," page 184. De Brosses says he got his information from a book written by Rogers himself in English and published at Amsterdam, by l'Honoré, in 1725.

were in the direction of the south pole at $61^{\circ} 53'$ south latitude, [longitude not given] where there was no night. * * * Like many other seamen Rogers prides himself on having been nearer the south pole than any one else."

La Barbinais⁹⁹ sailed round Cape Horn in 1715, going west. He says:¹⁰⁰ "The most southerly Cape of these islands, is the one of which Captain Hoorn made the discovery." A violent storm struck his ship at this time: "Our sails were carried away by the wind, and our vessel was for eight days the plaything of the waves. We went to the latitude of $61^{\circ} 30'$ towards the South."

Captain George Shelvocke,¹⁰¹ in 1719, on his journey round the world, reached, while rounding Cape Horn, $61^{\circ} 30'$ south latitude. An incident occurred then which is memorable, because it suggested the *Ancient Mariner*: "In short, one would think it impossible that any thing living could subsist in so rigid a climate; and indeed, we all observed, that we had not had the sight of one fish of any kind, since we were come to the southward of the Streights of le Mair, nor

⁹⁹ Le Gentil de La Barbinais: *Nouveau Voyage autour du monde*, Paris, chez Briasson, MDCCXXVIII.: (British Museum).

¹⁰⁰ *Nouveau Voyage*, etc., Tome I, page 33.

¹⁰¹ Shelvocke, George: *A Voyage round the world, by the way of the Great South Sea, performed in the years 1719, 20, 21, 22*, etc., London, MDCCXXVI., pages 69-74: (Bib. Nat. Paris).

one sea bird, except a disconsolate black albitross (*sic*) who accompanied us for several days, hovering about us as if he had lost himself, till Hatley (my second Captain) observing in one of his melancholy fits, that this bird was always hovering near us, imagin'd, from his colour, that it might be some ill omen. That which, I suppose, induced him the more to encourage his superstition, was the continued series of contrary tempestuous winds, which had oppressed us ever since we had got into this sea. But be that as it would, he, after some fruitless attempts, at length, shot the Albitross, not doubting (perhaps) that we should have a fair wind after it."

Admiral Jacob Roggeveen,¹⁰² a Hollander, sailed round the world in 1721-1722. His ships were the "Arendt," Captain Jobon Koster, on which he was himself; the "Thienhoven," Captain Jacob Bauman; and the "Afrikaansche Galei," Captain Heinrich Rosenthal.

¹⁰²*Nieuwe Werken van het Zeeuwsch Genootschap der Wetenschappen*: "Dagverhaal der Ontdekkings-reis van Mr. Jacob Roggeveen, met de Schepen den Arendt, Thienhoven, en De Afrikaansche Galei, in de jaren 1721 en 1722;" Te Middelburg, Gebroeders Abrahams, 1838: (Univ. Bib. Leyden).

Behrens, Carl Friedrich: *Der wohlversucht Süd Länder das ist ausführliche Reise Beschreibung um die Welt*; Leipzig, J. G. Monath, 1738: (Kön. Oef. Bib. Dresden).

B. [Behrens] Monsieur de: *Histoire de l'expédition de trois vaisseaux*; A la Haye, aux dépens de la Compagnie, M.D.CC.-XXXIX.: (Kön. Oef. Bib. Dresden).

Harris, John: *Navigantium atque Itinerantium Bibliotheca*, London, MDCCXLIV.: "The Voyages of Commodore Roggeveen": (British Museum).

They sailed on the 1st of August 1721 from Texel. In the latitude of the Strait of Magalhaês, they discovered an island, two hundred miles in circuit, which they called "Belgia Australis" (Falklands). After passing Strait Le Maire they rounded Cape Hoorn in January 1722, having stormy weather for three weeks. Roggeveen gives his highest latitude as $60^{\circ} 44'$. His diary says:¹⁰³

"1722. January 12; We found ourselves at the heighth of 60 degrees 30 minutes towards the South Pole" * * * January 13; in the south latitude of 60 degrees 1 minute * * * January 14; were in the latitude of 60 degrees 9 minutes south * * * January 15; found ourselves at the heighth of 60 degrees 44 minutes towards the South Pole * * * January 16; at 60 degrees 39 minutes south latitude."

Behrens, a member of the expedition, says they reached $62^{\circ} 30'$ south latitude and the map in the German edition of his narrative places this spot several degrees of longitude west of Cape Hoorn. Behrens' theory of the formation of icebergs is ingenious; it is the earliest mention I have seen suggesting that

Dalrymple, Alexander: *An Historical * * * in the South Pacific Ocean*, London, J. Nourse, MDCCCLXXI.; Vol. II., pages 85-120, "The voyage of Jacob Roggewein": (Kön. Oef. Bib. Dresden).

Marchand, Etienne: *Voyage autour du monde pendant les années 1790, 1791 et 1792*: In Vol. III. is: "Un examen critique du voyage de Roggewein, par C. P. Claret Fleurieu": (Kön. Oef. Bib. Dresden).

¹⁰³*Dagverhaal*, etc., pages 65-67.

icebergs are formed on land and not on the open sea; and the same paragraph contains also the first suggestion I have seen giving definite reasons why there must be lands of considerable dimensions near the South Pole:¹⁰⁴ "These icebergs, which one sees here at the heighth of Cape Horn or in more southern latitudes, show that the southern lands extend towards the Pole, as do the lands towards the North Pole; for one can easily see, that the icebergs cannot grow in the sea, *nor would such monsters increase from any greater distance than ice could freeze*¹⁰⁵ but the ice springs from the force of the streams and the strong winds from the gulfs and the lands. One would also notice no currents in the great Ocean, if these did not flow forth from the lands, as we ourselves noticed here towards the south-west."¹⁰⁶

Monsieur des Loziers (or Desloziers or de Lozier) Bouvet,¹⁰⁷ a French naval officer, in 1738-1739, made

¹⁰⁴ *Der Wohlversucht*, etc., page 50.

¹⁰⁵ This sentence is not clear in the German: "oder das ein solch ungestummes mehr von einer solchen weite zugeben würde, dass es Eis frieren könnte."

¹⁰⁶ John Harris in 1744 (*Navigantium* etc., page 270) gives some reasons why there must be a southern continent. One is "that there is wanting to the eye a Southern Continent in order to give one side of the globe a resemblance to the other, * * * the next is, that experience confirms this notion; the Fowls, the Winds, the Currents, the Ice, beyond Cape Horn, all confirm this opinion, that there is land towards the Southern Pole."

¹⁰⁷ *Mémoires pour l'histoire des Sciences et des Beaux-Arts*; Commencés d'être imprimés l'an 1701 à Trévoux; Paris,

a search for the southern lands, seen by the Sieur de Gonneville in 1503, and which were supposed

MDCXXL.; Février, 1740, pages 251-276: "Relation du voyage aux Terres Australes des Vaisseaux l'Aigle et la Marie": (British Museum). This is the original account of Bouvet's voyage and would appear to have been written by Bouvet himself.

Histoire Générale des Voyages, etc., Paris, Didot, M.DCC.-LIII.; Tome Onzième, pages 256-262: "Voyage de deux Vaisseaux François, aux Terres Australes": (Acad. Nat. Sci. Philadelphia).

De Brosse: *Histoire des Navigations aux Terres Australes*, Vol. II., pages 255-259. In this book, is a "Carte Générale," by the Sr. Robert de Vaugondy, Géog. ord. du Roi. This shows no antarctic lands except the "Cap de la Circoncision" and in about 42° south latitude, south of Tristan island (?) a "Cap des Terres Australes."

Dalrymple, Alexander: *A Collection of Voyages chiefly in the Southern Atlantick Ocean*; London, 1775: "Extrait du Voyage fait aux Terres Australes, les années 1738 & 1739, par Mr. des Loziers Bouvet, commandant la Frégate l'Aigle, accompagnée de la Frégate la Marie": (Kön. Oef. Bib. Dresden). At page 1 of the Preface is said: "This narrative was copied by M. d'Apres from the Archives of the French East India Company." With the map there is published a small outline drawing of the Cap de la Circoncision, and this is the earliest sketch I have seen of an antarctic land.

Le Gentil: *Voyage dans les Mers de l'Inde*; Paris, de l'Imprimerie Royale; Tome Second, MDCCLXXXI.; pages 482-498: "Article XVIII; Sur les Terres Australes" contains "Extrait du journal du voyage [du premier pilote du vaisseau l'Aigle] pour les découvertes des Terres Australes, dans le vaisseau l'Aigle, du 30 Décembre 1738 au 10 Janvier 1739": (Bib. Royale, Bruxelles; Acad. Nat. Sci. Philadelphia). According to A. Rainaud (*Le Continent Austral*, page 400) the pilot's name was Gallo. M. Rainaud also says most of the original documents about the expedition are at the Service Hydrographique de la Marine, Paris.

Burney: *A Chronological History*, etc., 1817, Vol. V., pages 30-37.

to lie south of the Cape of Good Hope.¹⁰⁸ Bouvet commanded the frigate "l'Aigle" and Monsieur Hays the frigate "la Marie." They left Lorient on the 19th or 29th of July, 1738. On December 15th, in 49° south latitude, they began to see great bergs. On January 1st, 1739, (the pilot says the 2d) the first pilot of the "Aigle" sighted, about 3 o'clock P. M., a high land covered with snow, about eight leagues distant, and which appeared to him to be a big headland. Bouvet presented twenty piastres to the pilot, and called the land "Cap de la Circoncision," in memory of the day. The land seemed to be four or five leagues long from north to south, and Bouvet says they could not determine whether it was a headland of a big land, or only an island. They charted its position as 54° south latitude, and 26° to 27° of longitude east of Teneriffe.

The ships beat about before this island for twelve days, and got several times within three or four leagues of the land, but they were never able to reach it in their boats, on account of the ice. Fogs also were heavy and persistent, and further effort seeming useless, after the 11th of January the ships sailed back to between 51° and 52° south latitude, and then followed this parallel eastward

¹⁰⁸ It has been suggested that de Gonneville reached Madagascar, Bresil or even Australia; it seems most probable, however, that his landfall was on Madagascar. See Burney: *A Chronological History*, etc., Vol. I., pages 377-379.

until January 25th, in between 51° and 55° longitude east of Teneriffe. They were always on the edge of the pack, and saw many birds, whales, and "sea wolves." Bouvet then went north in search of the place where Gonneville landed.

Bouvet's discovery was doubted, of course, by some people. Monsieur Le Gentil, for instance, argues that Bouvet did not see land at all, but only icebergs.¹⁰⁹ Nevertheless, Bouvet did see land and his voyage was the first definite attempt at antarctic exploration, the honor of which, therefore, belongs to France.

The Spanish ship "Lyon" or "Leon" left Lima for Cadiz on February 8, 1756. The Sieur Ducloz Guyot¹¹⁰ of Saint Malo, who was on board, wrote an account of the voyage. They sailed round Cape Hoorn. On June 28th, they were in $55^{\circ} 10'$ south latitude, $52^{\circ} 10'$ west longitude (?) and thought they saw land. On

¹⁰⁹ In the *Histoire de l'Académie Royale des Sciences*, Année MDCCLXXVI., Paris, M.DCCLXXIX., "Mémoires" etc., pages 665-666, and in the same *Histoire*, etc., Année MDCCLXXIX., Paris, MDCCLXXXII., pages 12-18, are three short memoirs by Monsieur Le Monnier, in which he shows the absurdity of the attacks which were made on Bouvet.

¹¹⁰ Dalrymple, Alexander: *A Collection of Voyages chiefly in the Southern Atlantick Ocean*, published from original MSS. ; London, 1775 : "Extrait d'un Journal de Navigation pour un voyage de la mer du Sud, fait par le S. Ducloz Guyot de St. Malo, dans le vaisseau espagnol le Lyon en 1756" : (Kön. Oef. Bib. Dresden).

Burney: *A Chronological History*, etc., Vol. V., pages 136-142.

the 29th "at about 9 A. M., we sighted a continent about twenty-five leagues long from northeast to southwest, filled with steep mountains of a frightful aspect, and of so extraordinary a height, that we could hardly see the summits, altho more than six leagues away." "Yesterday Don Domingo Dortiz, Lieutenant General of the armies of His Catholic Majesty, Count of the Peoples (*Peuplades*) and President of Chily, died at four o'clock in the afternoon (*après midy*) aged eighty years; and at ten o'clock this morning, he was thrown into the sea, after the usual ceremonies. The Spaniards saluted him with seven 'Long live the King' and wished him very respectfully a pleasant journey; lat., estimated, $54^{\circ} 48'$, long. $51^{\circ} 30'$."

On July 1, "we steered to the eastward, to observe whether the said land stretched further in that part. About 8 o'clock A. M. we saw its most easterly point by compass to the north 5° and about twelve leagues off. At midday, continuing on the same course, we were in $55^{\circ} 23'$ lat. estimated, and 51° long." On July 4, they again thought they saw land in $54^{\circ} 10'$ south latitude, but they were not sure. The rest of the narrative tells of the voyage home, and how they were in great danger from heavy storms and were nearly lost, and at this time they vowed one or two sails to "Our Lady of Sorrows." But the narrative does not say that she ever got them. There is no doubt that the land the "Lyon" sighted was

South Georgia, and it is noteworthy how much the account of Guyot resembles that of Vespucci.

Captain Marion du Fresne and the Chevalier Duclesmeur,¹¹¹ in the "Mascarin" and the "Marquis de Castries," discovered on January 13, 1772, and succeeding days, two groups of small islands in between 46° and 47° south latitude, and about 50° 30' and 59° 30' east longitude. They christened them Terre d'Espérance, Ile de la Caverne, Ile Froide, and Ile Aride, but they are now known as the Marion Islands and the Crozet Islands.

Captain Yves J. de Kerguelen Tremarec,¹¹² a French naval officer, made a voyage in 1771 with the *flutes* "La Fortune" and "Le Gros Ventre." On February 12,

¹¹¹ *Nouveau Voyage à la Mer du Sud*, commencé sous les ordres de M. Marion * * * et achevé * * * sous ceux de M. le Chevalier Duclesmeur * * * d'après les Plans et Journaux de M. Crozet; Paris, chez Barrois l'ainé, M.DCC.LXXXIII.: (Amer. Geog. Soc.).

Rochon, Alexis, membre de l'Institut National de France: *Voyages à Madagascar, A Maroe, et aux Indes Orientales*; Paris, An X de la République; Chez Prault et Levrault; Tome III., pages 325-327: (Kön. Oef. Bib. Dresden).

¹¹² Kerguelen, M. de: *Relation de deux voyages dans les mers Australes et des Indes, faits en 1771, 1772, 1773 & 1774* * * * A Paris, chez Knapen & fils, M.DCC.LXXXII.: (Amer. Geog. Soc. and British Museum).

Histoire de l'Académie royale des Sciences, Année MDCCLXXXVIII., Paris, MDCCXCI.; *Mémoires*, etc., pages 487-503:—Le Paute d'Agelet: "Observations faites dans un voyage aux Terres Australes, en 1773 & 1774": (Amer. Phil. Soc.).

1772, he sighted a small island¹¹³ in 50° 5' south latitude, 60° west longitude (Paris). On February 13, he discovered a much larger island, in 49° 40' south latitude, 61° 10' west longitude (Paris); of this he saw at least twenty-five leagues of coast. He was violently abused on his return home, and some people said:¹¹⁴ "in short that I had seen no land, but only a cloud and that I had ordered my entire crew to keep silence under penalty of their life."

Kerguelen sailed again the following year with "le Roland," "l'Oiseau," Captain Rosnevet, and "la Dauphine." On the 14th of December 1773, he resighted these islands and stayed about them until January 18, 1774.¹¹⁵ They were examined more carefully, a rough chart made, and the center charted as in 49° 30' south latitude, 68° west longitude (Paris). The main island was called Kerguelen Island. Some of the expedition landed on it on January 6, 1775, and took possession

M. d'Agelet says they made a landing (*nous atterâmes*) on December 14th, and another on January 6th: the first on the west coast, the second in the northwest in the Baye de l'Oiseau. He blames Kerguelen, according to the usual habit of mankind, for not doing more exploration. M. d'Agelet also mentions another account, which I have not seen, of this journey: "M. de Pagès, dans ses *Voyages*, publiés en 1782, donne une relation de cette expédition."

Rochon, Alexis: *Voyages à Madagascar*, etc., Tome III., pages 308-312.

¹¹³ *Relation*, etc., pages 21-24.

¹¹⁴ *Relation*, etc., page 37.

¹¹⁵ *Relation*, etc., pages 61-82.

of it in the name of the King of France: the shores were alive with antarctic animals and birds. Kerguelen's discovery is summed up in the following words:¹¹⁶ "There results at any rate from the labors of M. de Kerguelen, the discovery of an island of about two hundred leagues in circuit, with which he has enriched geography, and which the poisoned breath of envy will never be able to wipe off from the ball of the earth."

Lieutenant James Cook, R. N., on a voyage round the world in the ship "Endeavour," went, on January 30th, 1769, between the meridians of 74° and 75° west, to just beyond 60° south latitude. When approaching New Zealand, on October 7th, 1769, he wrote: "This land became the subject of much eager conversation; but the general opinion seemed to be that we had found the Terra Australis Incognita."¹¹⁷

Captain Cook, on his second voyage round the world, searched for the antarctic continent, whose existence, north of 60° south latitude, was asserted by Alexander Dalrymple.¹¹⁸ Captain Cook commanded

¹¹⁶ *Relation* etc.: "Extrait des Services de M. de Kerguelen" page 118.

¹¹⁷ Hawkesworth, John: *An Account of the Voyages undertaken by the order of his present majesty for making discoveries in the Southern Hemisphere*, London, MDCCCLXXIII.: (Lib. Co. Philadelphia).

¹¹⁸ In the introduction to one of his books, Alexander Dalrymple (*A Historical Collection * * * South Pacific Ocean*, London,

the "Resolution," and Captain Furneaux commanded the "Adventure."¹¹⁹ At the Cape of Good Hope, they found the Swedish naturalist, Dr. André Sparrman, and invited him to join the expedition. From the

Vol. I., MDCCLXX.: Bib. Nat. Paris) wrote of the probability of a continent extending from 30° south latitude to the pole, and urged that expeditions of discovery be sent. When Cook's expedition was sent, Dalrymple appears to have been much disappointed at not being chosen leader. But his services to geography, in helping to bring about the search, deserve to be remembered.

¹¹⁹ Cook, James: *A Voyage towards the South Pole and Round the World*, performed in His Majesty's Ships the "Resolution" and "Adventure," in the years 1772, 1773, 1774 and 1775: Second Edition, London, W. Strahan and T. Cadell, MDCCLXXVII.: (Lib. Co. Philadelphia).

Journal of the Resolution's Voyage, in 1772, 1773, 1774 and 1775, on Discovery of the Southern Hemisphere, by which the non existence of an undiscovered Continent, between the Equator and the 50th Degree of Southern Latitude, is demonstrably proved: Also a *Journal of the Adventure's Voyage*, in the years 1772, 1773, and 1774; Dublin, Caleb Jenkin, MDCCLXXVI.: (Pub. Lib. New York City).

Forster, George, F. R. S.: *A Voyage Round the World*, in his Britannic Majesty's Ship "Resolution," commanded by Captain James Cook, during the years 1772, 3, 4 and 5; London, B. White, J. Robson, P. Elmsley, G. Robinson, MDCCLXXVII.: (Kön. Oef. Bib. Dresden). There is a good "A Chart of the Southern Hemisphere" in the first volume of this book; the only antarctic lands marked are Kerguelen Island, the Marion Islands, Sandwich Land and South Georgia.

Sparrman, Dr. André: *Voyage au Cap de Bonne Espérance et Autour du Monde, avec le Capitaine Cook*; Paris, chez Buisson, MDCCLXXXVII.

Low, Lieutenant Charles R., (H. M. Indian Navy): *Captain Cook's Three Voyages Round the World*; London, George Routledge and Sons: (Public Lib. Tacoma).

Cape, Cook proceeded south and east, and on January 17th, 1773, crossed the Antarctic Circle in $39^{\circ} 35'$ east longitude, and reached $67^{\circ} 15'$ south latitude. Here he was stopped by a pack composed of field ice, with thirty-eight ice islands in sight. He turned northward, and later southward. On the 23d of February, he reached $61^{\circ} 52'$ south latitude, $95^{\circ} 2'$ east longitude. Here there were so many ice islands, that he gave up attempting to cross the Antarctic Circle, and continued on an eastward course until, on March 17th, he reached $59^{\circ} 7'$ south latitude, $146^{\circ} 53'$ east longitude, when he bore away north.

In December 1773, Cook again went south, and on December 22d, reached $67^{\circ} 31'$ south latitude, $142^{\circ} 54'$ west longitude, where he was stopped by the pack. On January 30th, 1774, he reached $71^{\circ} 10'$ south latitude, $106^{\circ} 54'$ west longitude, where a great ice field, in which ninety-seven ice hills were in sight, blocked further progress. Cook did not suggest that any land was in sight, in fact he says :¹²⁰ "As we drew near this ice some penguins were heard, but none seen ; and but few other birds, or any other thing that could induce us to think any land was near. And yet I think there must be some land to the south behind this ice."¹²¹ He then went in search of the Terra

¹²⁰ *A Voyage*, etc., Vol. I., page 268.

¹²¹ Nevertheless two writers, Sir J. C. Ross and Mr. C. E. Borchgrevink, mention Captain Cook as having perhaps discovered the Antarctic Continent at this time.

Australis Incognita that Juan Fernandez was said to have discovered.

In January 1775, Cook went south from Staaten Land, and Forster states¹²² that they steered in search of the land reported by La Roché in 1675, and by Ducloz Guyot in 1756. On January 14th, in 53° 56' south latitude, 39° 24' west longitude, Cook arrived at the land, which was discovered, perhaps by Amerigo Vespucci, certainly by La Roché, and which was seen by the Spanish ship "Lyon." It lies between 53° 57' and 54° 57' south latitude, and 38° 13' and 35° 34' west longitude. Cook spent several days there and at the suggestion of the elder Forster,¹²³ re-named it the Isle of Georgia. He then stood eastward again, and on January 31st, discovered Sandwich Land in 59° south latitude, 27° west longitude, and on the same day another coast in 59° 13' south latitude, 27° 45' west longitude, which was named Southern Thule. On February 1st, he sighted Cape Montagu, and on the 3d, in 57° 11' south latitude, 27° 6' west longitude, two islands, which he called the Candlemas Isles. After a vain search for Bouvet Island, he returned to the Cape.

This voyage of Cook was the first circumnavigation of the south polar regions, and really closes the first period of antarctic discovery, because it did away with

¹²² *A Voyage, etc.*, Vol. II., page 524.

¹²³ *A Voyage, etc.*, Vol. II., page 525.

the legendary belief in a great Terra Australis Incognita north of 60° south latitude.¹²⁴ In a certain sense the outcome was negative, in that Antarctica was not discovered, a fact which would seem to rank the voyage of Cook as of much less importance than the voyage of Wilkes. With that single exception, however, perhaps no one achieved such great geographical results in the south polar regions as Cook, and it is possibly not going too far to assign him the second place among antarctic explorers.¹²⁵

¹²⁴ Capitaine, Ls. : *Atlas Élémentaire*, Paris, 1793 : (Kön. Oef. Bib. Dresden). Map No. 1, "Mappemonde" shows no antarctic land, except the Cap de la Circoncision, altho on both hemispheres beyond 60° is marked "Terres Australes."

Many of the maps, however, from the time of Cook until recently, mark "Antarctic Ocean" across the regions of the South Pole. This is, for instance, the case in *The Student's Atlas*, by William Hughes, London, about 1880.

¹²⁵ Professor Gregory (*The Popular Science Monthly*, New York, 1902, Vol. LX., pages 209-217 :—Professor J. W. Gregory : "Antarctic Exploration") says : "Cook's voyage was brilliantly successful and still ranks as the greatest of Antarctic achievements."

II.

VOYAGES UP TO AND INCLUDING THE DISCOVERY OF THE CONTINENT OF ANTARCTICA.

The second period of antarctic discovery may be looked on as beginning after the voyage which finally did away with the belief in the legendary "Terra Australis" north of 60° south latitude and as ending with the discovery by Charles Wilkes, that after all there is a great antarctic land, even if it is smaller than the land of legend.

Captain James Cook¹²⁶ inaugurated the second period on his third voyage round the world. On December 12th, 1776, he sighted the Marion and the Crozet Islands, and on December 24th, Kerguelen Island, landing there on December 25th, in "Christmas Harbor," and staying near the island until December 30th.

Captain Marchand touched 60° south latitude in his voyage round the world.¹²⁷

¹²⁶ Cook, Captain James: *A Voyage to the Pacific Ocean* * * * in the years 1776, 1777, 1778, 1779, and 1780: London, MDCCLXXXIV., Vol. I., pages 52-55: (Lib. Co., Philadelphia).

¹²⁷ Marchand, Etienne: *Voyage autour du Monde pendant les années 1790, 1791, et 1792*; Paris, Imprimerie de la République, An VI.: (Kön. Oef. Bib. Dresden).

In 1794, the Spanish *corvette* "Atrevida" was sent to survey the Aurora Islands, which were discovered, it was said, in 1762, by the ship "Aurora."¹²⁸ In 1769, the ship "San Miguel" saw some islands, which it was suspected were the Auroras. In 1774, the ship "Aurora" again reported them. Three other vessels, the "Pearl" in 1779, and the "Dolores" and the "Princess" in 1790, also are said to have seen these islands. The "Atrevida" went purposely to situate them and reported that the islands were three in number; and that the southernmost was in $53^{\circ} 15'$ south latitude, $47^{\circ} 57'$ west longitude; the second in $53^{\circ} 2'$ south latitude, $47^{\circ} 55'$ west longitude; and the third in $52^{\circ} 37'$ south latitude, $47^{\circ} 43'$ west longitude. The Spanish officers, however, said that none of the circumstances connected with the islands which they saw, agreed with those reported of the Auroras.¹²⁹

Captain Rhodes¹³⁰ in 1799, commanding the ship "Hillsborough," spent eight months on the north coast of Kerguelen Island.

¹²⁸ This account is compiled from Captain James Weddell's *A Voyage towards the South Pole*, pages 61-67, in which Weddell quotes the publications of the *Royal Hydrographical Society of Madrid*, 1809, *Memoria Segunda*, tomo 1^o, pages 51, 52, and appendix to same, Vol. I., page 213, Number IV.

¹²⁹ See *post*, pages 100, 107, 110.

¹³⁰ *Dr. A. Petermann's Mittheilungen*, etc., Gotha, 1858, pages 17-33:—A. Petermann: "Die Sogenannten 'König-Max-Inseln,' Kerguelen, St. Paul, Neu-Amsterdam, u. s. w.,".

Captain Swain, in 1800, was the first American to make an antarctic discovery:¹³¹ "Swain's Island, latitude 59° 30' south, longitude 100° west by calculation, discovered by Captain Swain, of Nantucket, in 1800. Resorted to by many seals." There is also another account¹³² of this event: "Captain Swain, while passing from Sandwich Islands to Cape Horn, ran farther south than usual for whale ships, and discovered an island in latitude 59° south, and longitude 90° west, covered with snow, and abounding with sea-dogs and fowl. This must be the same island discovered by Captain Macy, an account of which is given before." The account of the discovery made by Captain Richard Macy, of Nantucket, which appears to have taken place a few years after Swain's, is as follows:¹³³ "Captain Macy discovered an island four or five miles in extent, in south latitude 59°, and west longitude 91°, his ship passing near enough to see the breakers. The island abounded with sea

¹³¹ Fanning, Edmund: *Voyages Round the World; with selected sketches of Voyages to the South Seas, North and South Pacific Oceans, China, etc.*, between the years 1792 and 1832: New York, Collins & Hannay, MDCCCXXXIII., page 447: (Pub. Lib. Boston; Harvard Univ. Lib.; Lib. Co. Philadelphia; Amer. Geog. Soc.).

¹³² Reynolds, J. N.: *Address on the subject of a surveying and exploring expedition to the Pacific Ocean and South Seas*; delivered in the Hall of Representatives on the evening of April 3, 1836; New York, Harper and Brothers, 1836, page 224: (Harvard Univ. Lib.; Amer. Phil. Soc.; Geog. Soc. Philadelphia).

¹³³ *Address, etc.*, page 216.

dogs, or seals, and the water was much coloured, and thick with rock-weed."¹³⁴

This island does not appear to be charted. It is perhaps the one now known as "Dougherty Island"¹³⁵ as the latitudes correspond, and sealing captains, owing to the lack of instruments, may easily have made errors in their longitude.

Mr. James Lindsay,¹³⁶ master of the "Snow Swan," and Mr. James Hopper, master of the "Otter," English whaling vessels, sighted Bouvet Island in 1808, the former on October 6th, the latter on October 10th. They recognized the *Cap de la Circoncision*, but could not land, on account of fogs and ice. The island was determined to be in 54° 15' south latitude, 4° 15' east longitude.

In the spring of the year 1812, Mr. Edmund Fanning¹³⁷ was appointed commander of an American discovery expedition, to consist of the ships "Volunteer"

¹³⁴ See also: *Executive Documents, 23d Congress, 2d Session, Doc. No. 5*; January 27, 1835: "A report of J. N. Reynolds, in relation to islands, reefs, and shoals in the Pacific Ocean" etc. (dated) New York, September 24, 1828: (Lib. Co., Philadelphia).

¹³⁵ See *post*, pages 185, 186.

¹³⁶ Burney: *A Chronological History*, etc., Vol. V., pages 35-37.

¹³⁷ *Voyages*, etc., pages 492-494.
Executive Documents, 26th Congress, 1st Session, 1839-40, Vol. II., Doc. No. 57: "Memorial of Edmund Fanning."

and "Hope," intended for the exploration of the southern hemisphere and a voyage round the world. The expedition was on the point of sailing, when, owing to the breaking out of war, it was given up. About this time, however, it is barely possible that West Antarctica was rediscovered. Dr. Fricker¹³⁸ says: "At all events, probability points that way, and it is certain that the English hydrographer, James Horsburgh,¹³⁹ told the German geographer, Heinrich Berghaus, that the island group had been a station for American seal hunters since 1812. The motive for keeping its existence secret was the desire to retain the sole use of the station for their own profit." It would seem probable that Mr. Horsburgh's information was incorrect, since Fanning says nothing of the matter. Still, further evidence may yet be found.

Mr. William Smith,¹⁴⁰ master of the brig "Williams" of Blythe, took an unusually southern course round

¹³⁸ Fricker, Dr. Karl: *The Antarctic Regions*, London, Swan Sonnenschein & Co.; New York, The Macmillan Company, 1900, page 47. A translation of *Antarktis, Bibliothek der Länderkunde*, Berlin, Schall & Grund, 1898.

¹³⁹ Mr. Horsburgh does not mention this matter in what seems to be his only paper about the Antarctic: *Philosophical Transactions of the Royal Society of London*, MDCCCXXX, pages 117-120:—Horsburgh, Captain James: "VII. Remarks on several icebergs which have been met with in unusually low latitudes in the southern hemisphere."

¹⁴⁰ *The Edinburgh Philosophical Journal*, Vol. III., Edinburgh, 1820: pages 367-380, Art. xxi., "Account of the Dis-

Cape Hoorn in February 1819. Apparently by accident, on February 19th, he sighted some islands in $62^{\circ} 17'$ south latitude, $60^{\circ} 12'$ west longitude. On October 15th following, he reached the same islands and this time examined them more carefully, christening several of them and calling the whole group New South Shetland. He thought he could distinguish through the telescope trees similar to the Norway pine. Mr. Smith appears to have gathered the impression that the Shetlands were a more or less connected mass of land, in fact he speaks of some of them as the mainland. His chart, however, shows that he was always north of the Shetlands.

Captain James P. Sheffield¹⁴¹ and Supercargo William A. Fanning sailed in the brig "Hersilia" of Stonington, in July 1819, on an exploring and sealing voyage. This was due to the initiative of Mr. Edmund Fanning. He had read the account of Gerritsz's discovery of land at the south of Cape Hoorn, and had seen also the breaking up of the winter ice at South Georgia and had noticed that ice islands

covery of New South Shetland, with observations on its importance in a Geographical, Commercial and Political point of view ; with two Plates:" by Mr. J. Miers: communicated by Mr. Hodgskin: (Amer. Phil. Soc.).

Neue Allgemeine Geographische Ephemeriden, Weimar, VIII., 1820 ; pages 81-83: "Das neue Antarktische Continent oder New Schottland": (Bib. Nat. Paris).

¹⁴¹ Fanning, Edmund: *Voyages Round the World*, etc., pages 428-434.

came floating there after west-south-west gales: he believed, therefore, that there was land in that quarter, and this was the inducement for the search. On the return of the "Hersilia," Sheffield and Fanning reported that they had seen the Aurora Islands, and then proceeded south, and that in about 63° south latitude, in February 1820, they had found several islands. One they called Mount Pisgah Island, others Fanning's Islands, and another Ragged Island, on which they effected a landing at Hersilia Cove, the second recorded landing in Antarctica. They did not rename the group, believing it was Gerritsz Land. They captured many seals and this voyage was the forerunner of those which resulted in the extermination of the antarctic fur seal.

Mr. Edward Bransfield, R. N.,¹⁴² sailed from Valparaiso on December 20th, 1819, in the brig "Williams,"

¹⁴² *Journal des voyages, découvertes et navigations modernes*, par J. T. Verneur, Tome Dixième, Paris, Colnet, 1821, pages 5-24: "Relation de la découverte de la nouvelle Shetland méridionale; avec des remarques sur l'importance de cette découverte sous les rapports géographiques, commerciaux et politiques; Par J. Miers; communiqué par H. Hodgskin": (Bib. Nat. Paris). This paper, dated Valparaiso, January 1820, states that Dr. Young, who accompanied Bransfield, and who apparently furnished the data for the paper, was the second surgeon of the English sloop of war "Slaney." The writer makes some remarks as to whether South Shetland is a big island or part of a continent and he concludes (page 23): "Des recherches récentes ont fait connaître que les montagnes de glace tirent toujours leur origine de terres limitrophes. Entre les méridiens de 40° et 60° O., les montagnes de glace ne

to examine Mr. Smith's newly found islands. He reached the Shetlands on January 16th, 1820, in $62^{\circ} 26'$ south latitude and $60^{\circ} 54'$ west longitude. Three days afterwards, about two degrees more to the eastward, he anchored in an extensive bay and was able to land, apparently the first time any one did so in Antarctica. He found also some stunted grass, and this seems to be the first time vegetation was noticed in Antarctica. Like Mr. Smith, Bransfield appears to have considered the Shetlands as a more or less connected mass of land, for Dr. Young's (?) involved account speaks of them as a line of coast which "appeared high, bold and rugged." He says

paraissent partout qu'a un degré de latitude un peu inférieur, d'où nous pouvons conclure, qu'entre ces méridiens, il existe au sud, une étendue de pays considerable ; et nous croyons, d'après cela, pouvoir regarder comme certain que la nouvelle Shetland méridionale et le pays de Sandwich forment les avances d'un immense continent." The paper is interesting, because it is one of the first attempts to give reasonable grounds for the possible existence of an Antarctic Continent. It would seem also to show that Bransfield did not sight any part of the mainland of West Antarctica, as otherwise the writer of this paper would have made some mention, apparently, of seeing land near their most southern point.

The Edinburgh Philosophical Journal, Vol. IV., Edinburgh, 1821, pages 345-348, Art. XVII., "Notice of the Voyage of Edward Bransfield, Master of His Majesty's Ship *Andromache*, to New South Shetland" : (Amer. Phil. Soc.). This paper is signed "H. M. S. Slaney" and I supposed at first that that was the name of the writer, and used it thus in *The Journal of the Franklin Institute*, Vol. CLI., 1901, page 255. Dr. Hugh Robert Mill (*The Antarctic Manual*, London, 1901, page 529: "Bibliography of Antarctic Exploration and Research") made the

further that the land was traced nine or ten degrees east and west and about three degrees north and south, and that they could not ascertain whether it was part of a continent or only a group of islands. "If it is insular, there must be some of an immense extent, as we found a gulf nearly 150 miles in depth, out of which we had some difficulty in finding our way back again."

According to the English Admiralty charts, Nos. 1238 and 1240, Bransfield's course must have been north of the Shetlands, then eastward, then southward, along about the meridian of $52^{\circ} 30'$ west longitude, to about $64^{\circ} 30'$ south latitude, and this cruise is probably what Dr. Young refers to as a "gulf." From his position, therefore, Bransfield may have sighted Joinville Island, or even one of the peaks of the mainland,¹⁴³ but this at present is uncertain. The broad strait between South Shetland and Palmer Land or Archipelago is universally known as "Bransfield Strait." I have found no record saying by whom or when this name was given.

same mistake and attributed this paper to "[Slansy, H. M. S.]" The paper published in the *Journal des Voyages*, etc., however, shows that the author was Dr. Young, of "His Majesty's Ship Slancy." It is certainly an original mode of publication to sign a paper, without further explanation, by the name of a boat.

Neue Allgemeine Geographische Ephemeriden, Weimar, VIII., 1820, pages 490-493: "Weitere und neueste nachrichten von dem neuentdeckten Antarktischen Lande."

¹⁴³From a statement in D'Urville's *Voyage au Pole Sud*, etc., Vol. II., page 11, it seems as if this inference may be correct.

Captain Fabian Gottlieb von Bellingshausen,¹⁴⁴ in the "Vostok" (the Orient), and Captain Lazarew, in the "Mirny" (the Pacific), in 1819-1821, led a Russian expedition to the Antarctic, of which they made the second circumnavigation. They left Kronstadt in 1819, and in December sailed along the south coast of South Georgia. On January 3d and 4th, 1820, they discovered the Traversey Islands, in 56° 41' south

D'Urville says of Bransfield: "D'après cette carte, il aurait même aperçu, dans le sud de l'île Bridgman, une haute montagne couverte de neige, par 63° 20' latitude S. et 59° 38' longitude O. environ." The map here referred to I have not seen. D'Urville says that it is one of New South Shetland by Laurie and that it gives Bransfield's route: it is therefore evidently not Powell's chart. The date of this map is not given by D'Urville and it may antedate Powell's chart, but it seems most probable that it was published after 1824, since D'Urville speaks also (page 24) of Laurie's map as giving indications about a Captain Hoseason in 1824.

¹⁴⁴ Bellingshausen's narrative has been published in full only in Russian: *Dvukratnaya isiskaniya v' Juznom Ledovitom Okeanije i plavanie wokrug svjeta*, &c.; St. Petersburg, 1831: (Justus Perthes' Geographischer Anstalt, Gotha). In the atlas are woodcuts of Peter I. Island, and Alexander Land.

Simonow, Iwan: *Beschreibung einer neuen Entdeckungsreise in das südliche Eismeer*; Aus dem Russischen übersetzt von M. Banyi; Wien, J. B. Wallishauser, 1824: (Kön. Oef. Bib. Dresden). Simonow was the astronomer of the expedition.

Bibliothèque Universelle des Voyages, par M. Albert Monté-
mont, Paris MDCCCXXXIV.; Tome XXI., pages 431-448:
"Bellingshausen": (Amer. Geog. Soc.).

Archiv für wissenschaftliche Kunde von Russland, A Erman, Berlin, 1842, Vol. II., pages 125-175:—Lowe, F.: "Bellingshausens Reise nach der Südsee und Entdeckungen im Südlichen Eismeer": (Lib. of Congress).

latitude, $28^{\circ} 9'$ west longitude. On the 8th, they determined that the Candlemas Isles were small islands and not a coast. They then sailed south and east. On January 28th, Bellingshausen reached $69^{\circ} 21'$ south latitude, $2^{\circ} 15'$ west longitude, and on February 2d, $66^{\circ} 25'$ south latitude, $1^{\circ} 11'$ west longitude, at both of which positions he was stopped by the pack. He then steered eastward, and on February 17th reached $69^{\circ} 6'$ south latitude, and on the 19th, $68^{\circ} 5'$ south latitude, $16^{\circ} 37'$ east longitude. Later, he reached $66^{\circ} 53'$ south latitude, $40^{\circ} 56'$ east longitude, where he thought land must be near, on account of the numbers of birds.

The following southern summer, Bellingshausen started from Sydney and sailed south and east. Mr. Montémont says: "On the 11th of January, 1821, we discovered, in $69^{\circ} 30'$ south latitude, an island, which we named in honor of the founder of our navy, Peter I. Island. The 17th of the same month, we discovered a coast in the same latitude, to which, in honor of the sponsor of our journey, we gave the name of Alexander I. The lands are surrounded with ice, which prevented us from approaching them and examining them near by. The discovery of these two islands is moreover remarkable in that of all these lands they are the most southerly which have yet been discovered in this hemisphere." Herr Lowe adds: "The sudden change in the color of the water led Captain Bellingshausen to

believe that this [Alexander] land must be of considerable size." Simonow writes: "Both islands are surrounded on all sides by ice. * * * If therefore the coast of Alexander Land is not the point of a dry land, then must I confirm the words of Cook and also say that we saw no trace of the supposed polar land, unless there was one beyond the limits of our vision, where however the eternal and impenetrable ice has placed a bar to navigation." The testimony is somewhat conflicting, as to whether Alexander Land is a part of a great land or only an island: if it is the former, Bellingshausen may have been the first to sight the mainland of West Antarctica, but this must remain an open question for the present.¹⁴⁵

From Alexander Land, Bellingshausen sailed to the Shetlands, to which he gave Russian or Napoleonic names: Borodino, Smolensk, Leipzig, Waterloo (James Island), Mordwinow (Elephant Island), etc., and where Simonow says they met over fifty American and Eng-

¹⁴⁵ According to Dr. F. A. Cook (*Bulletin American Geographical Society*, Vol. XXXIII., 1901, pages 36-41; "Captain Fabian Gottlieb von Bellingshausen") it is probable that Alexander Land is an island group. Dr. Cook quotes from his own log as follows: "The vast number of icebergs to the eastward of the land gave it also, from a greater distance, the appearance of being connected with some larger land; but from our various positions we were able to make out distinctly that the islands are a separate group, with no other land in sight to the east." This would seem to show that Bellingshausen was not the first to sight the mainland of West Antarctica.

lish ships. One of these was the "Hero," commanded by Nathaniel B. Palmer.¹⁴⁶ Bellingshausen then returned to Russia, passing South Georgia on his homeward route.

Bellingshausen's voyage is one of the most important, for he narrowed considerably the unexplored regions of the South Pole, and crossed six times the Antarctic Circle, within which he sailed long distances.

Captain Nathaniel B. Palmer,¹⁴⁷ an American sealing captain, comes next in chronological order; and I quote his first two voyages in full, because of their importance in the history of antarctic discovery.

"The next season after the *Hersilia's* return from the South Shetlands, a fleet of vessels, consisting of the brig *Frederick*, Captain Benjamin Pendleton the senior commander; the brig *Hersilia*, Captain James P. Sheffield, schooners *Express*, Captain E. Williams, *Free Gift*, Captain F. Dunbar, and sloop *Hero*,

¹⁴⁶ Mr. Henryk Arctowski, an accurate observer and writer, who has the advantage of being able to read Russian, says (*The Geographical Journal*, London, 1901, Vol. XVIII., pages 353-394: "The Antarctic voyage of the 'Belgica' during the years 1897, 1898, and 1899"): "This meeting was also described by Bellingshausen himself, as can easily be seen by consulting the remarkable, but still little known work of that eminent Russian explorer (*Dwukratnyja*, etc., Vol. II., pages 263, 264)."

¹⁴⁷ Fanning, Edmund: *Voyages Round the World*, etc., pages 434-440.

Captain N. B. Palmer, was fitted out at Stonington, Connecticut, on a voyage to the South Shetlands. From Captain Pendleton's report, as rendered on their return, it appeared that while the fleet lay at anchor in Yankee Harbor, Deception Island, during the season of 1820 and 21, being on the lookout from an elevated station, on the mountain of the island during a very clear day he had discovered mountains (one a volcano in operation) in the south; this was what is now known by the name of Palmer's Land; from the statement it will be perceived how this name came deservedly to be given to it, and by which it is now current in the modern charts. To examine this newly discovered land, Captain N. B. Palmer, in the sloop *Hero*, a vessel but little rising forty tons, was despatched; he found it to be an extensive mountainous country, more sterile and dismal if possible, and more heavily loaded with ice and snow, than the South Shetlands; there were sea leopards on its shore, but no fur seals; the main part of its coast was ice bound, although it was in the midsummer of this hemisphere, and a landing consequently difficult.

“On the *Hero's* return passage to Yankee Harbor she got becalmed in a thick fog between the South Shetlands and the newly-discovered continent, but nearest the former. When this began to clear away, Captain Palmer was surprised to find his little barque between a frigate and sloop of war,

and instantly run up the United States' flag; the frigate and sloop of war then set the Russian colors. Soon after this a boat was seen pulling from the commodore's ship for the Hero, and when alongside, the lieutenant presented an invitation from his commodore for Captain P. to go on board; this of course was accepted. These ships he then found were the two discovery ships sent out by the Emperor Alexander of Russia, on a voyage round the world. To the commodore's interrogation if he had any knowledge of those islands then in sight, and what they were, Captain P. replied, he was well acquainted with them, and that they were the South Shetlands, at the same time making a tender of his services to pilot the ships into a good harbor at Deception Island, the nearest by, where water and refreshment such as the islands afforded could be obtained; he also informed the Russian officer that his vessel belonged to a fleet of five sail, out of Stonington, under command of Captain B. Pendleton, and then at anchor in Yankee Harbor, who would most cheerfully render any assistance in his power. The commodore thanked him kindly 'but previous to our being enveloped in the fog' said he 'we had sight of those islands, and concluded we had made a discovery, but behold, when the fog lifts, to my great surprise, here is an American vessel apparently in as fine order as if it were but yesterday she had left the United States; not only this, but her

master is ready to pilot my vessels into port; we must surrender the palm to you Americans,' continued he, very flatteringly. His astonishment was yet more increased, when Captain Palmer informed him of the existence of an immense extent of land to the south, whose mountains might be seen from the masthead when the fog should clear away entirely. Captain Palmer, while on board the frigate, was entertained in the most friendly manner, and the commodore was so forcibly struck with the circumstances of the case, that he named the coast then to the south, Palmer's Land; by this name it is recorded on the recent Russian and English charts and maps which have been published since the return of these ships. The situation of the different vessels may be seen by the plate; they were at the time of the lifting of the fog and its going off to the eastward, to the south, and in sight of the Shetland Islands, but nearest to Deception Island. In their immediate neighborhood were many ice islands, some of greater and some of less dimensions, while far off to the south, the icy tops of some two or three of the mountains on Palmer's Land could be faintly seen; the wind at the time was moderate, and both the ships and the little sloop were moving along under full sail.

"The following season in 1821 and 22, Captain Pendleton was again at Yankee Harbor with the Stonington fleet; he then once more despatched

Captain Palmer in the sloop James Monroe, an excellent vessel of upwards of 80 tons, well calculated for such duties, and by her great strength well able to venture in the midst of and wrestle with the ice. Captain Palmer reported on his return, that after proceeding to the southward, he met ice fast and firmly attached to the shore of Palmer's Land; he then traced the coast to the eastward, keeping as near the shore as the ice would suffer; at times he was able to come along shore, at other points he could not approach within from one to several miles owing to the firm ices, although it was in December and January, the middle summer months in this hemisphere. In this way he coasted along this continent upwards of fifteen degrees, viz. from 64 and odd, down below the 49th of west longitude. The coast, as he proceeded to the eastward, became more clear of ice, so that he was able to trace the shore better; in 61° 41' south latitude, a strait was discovered which he named Washington Strait, this he entered and about a league within, came to a fine bay which he named Monroe Bay, at the head of this was a good harbor; here they anchored, calling it Palmer's Harbor. The captain landed on the beach among a number of those beautiful amphibious animals, the spotted glossy-looking sea leopard, and that rich golden colored noble bird, the king penguin; making their way through these, the captain and party traversed the coast and country for some distance around, without discovering

the least appearance of vegetation excepting the winter moss. The sea leopards were the only animals found; there were, however, vast numbers of birds, several different species of the penguin, Port Egmont hens, white pigeons, a variety of gulls, and many kinds of oceanic birds; the valleys and gulleys were mainly filled with those never dissolved icebergs, their square and perpendicular fronts several hundred feet in height, glistening most splendidly in a variety of colors as the sun shone upon them. The mountains on the coast, as well as those to all appearance in the interior, were generally covered with snow, except when their black peaks were seen here and there peeping out."

This voyage was recorded also in 1822 by George Powell,¹⁴⁸ in whose memoir the following statements are made: "I have not been on the south side of the land myself, but I received my information respecting it from the descriptions and sketches of my friends, Captain John Walker, Captain Ralph Bond, and Mr. Charles Robinson; and by comparing these documents together, and the information I have received from other masters of vessels, I conclude that the description will be found exact. Of the land to the southward, called Palmer's Land, very little can be said, as it does not appear to be sufficiently explored; but it

¹⁴⁸ *Chart of South Shetland, etc.: Notes on South Shetland, etc.*, pages 12, 6, : *Annales Maritimes, etc. : Journal des voyages, etc.* See *post*, pages 95, 96.

has been described as very high, and covered with snow, with inlets, forming straits, which may probably separate the land, and constitute a range of islands, similar to those of South Shetland; at least such is the appearance of the northern side, which alone has yet been explored." And also: "Off the N. W. side of Elephant Island, latitude $61^{\circ} 3'$, longitude $55^{\circ} 30'$. Seal Island and Reef is stated in our Memoir, page 15, to be in $61^{\circ} 1'$ south, and $55^{\circ} 33'$ west. The *Trinity Land* and *Tower Island* of the first charts, in about $63\frac{1}{2}^{\circ}$ South, and $60\frac{1}{2}^{\circ}$ West, are given up as imaginary or as icebergs only. Ed."

Captain Palmer made numerous other voyages, some of which appear to be unrecorded. He certainly made one in 1828-29, for he is mentioned by Dr. Webster of the "Chanticleer." In 1829-30, Captain B. Pendleton and Captain Palmer,¹⁴⁹ in the brigs

¹⁴⁹ Fanning, Edmund: *Voyages Round the World*, etc., pages 478-491. Fanning had some knowledge of the extent of the western mainland, for on page 476, he says: "but from the information the author has in his possession, it is presumed that the continent of Palmer's Land does not extend further west than to the roodth degree of west longitude." This is, probably, the most authoritative hint of the existence of a south polar continent before the discovery by Wilkes. Fanning wished to have the Antarctic explored scientifically, and urged the matter in a paper: *Memorial of Edmund Fanning; To illustrate the views in a petition presented to Congress, praying that a national discovery and exploring expedition be sent to the South Seas, &c.*, December 18, 1833; 23d Congress, 1st Session: Referred to the Committee on Naval Affairs and ordered to be printed: (Lib. Co., Philadelphia).

“Seraph” and “Annawan,” made a cruise north and west of Palmer Land. Some scientists went on this expedition, among whom were Messrs. John N. Reynolds and Watson. Mr. Reynolds¹⁵⁰ afterwards took a leading part in the formation and start of the United States Exploring Expedition, and in urging Congress in 1836 to send the latter, he said among other things:¹⁵¹ “It was in company with this same Captain Palmer, during my late voyage to the South Seas, that I visited the whole of this extensive group of islands lying north of the coast of Palmer’s Land, the extent of which neither we nor any subsequent navigators have as yet ascertained; though a British vessel touched at a single spot in 1831, taking from it the American and giving it an English name.”¹⁵² Mr. Reynolds also gave an almost identical account as that of Fanning of the meeting of the Russian com-

¹⁵⁰ *Address on the subject of a Surveying and Exploring Expedition to the Pacific Ocean and South Seas*: Delivered in the Hall of Representatives on the evening of April 3, 1836, by J. N. Reynolds: New York, Harper and Brothers, 1836: (Harvard Univ. Lib.; Amer. Phil. Soc.; Geog. Soc. Philadelphia).

¹⁵¹ *Address*, etc., page 34.

¹⁵² Graham Land. This name has been used most incorrectly for the mainland of West Antarctica. It is merely a local name and applies only to the west coast between Alexander Land and Danco Land. It is correctly placed on the “South Polar Chart” by Captain W. J. L. Wharton, R. N., F. R. S., Hydrographer: published at the [British] Admiralty, 20th May, 1887: Small corrections, III., 01: Chart No. 1240.

mander and the American sealing captain, and of the naming of Palmer Land.

Dr. W. H. R. Webster,¹⁵³ of the "Chanticleer," has fortunately recorded his impressions of Palmer, for, thanks to him, we get a glimpse of the personality of the discoverer of Palmer Land. "Early on the following morning, Sunday, 25th October, Captain Foster left us, in quest of a harbour for the reception of the Chanticleer, while the pendulum experiments were going forward. After examining New Year's Harbour, which he did not approve of, in his way along the coast he discovered an American schooner at anchor in one of the creeks: the name of the schooner was the Penguin of Stornington (*sic*): and the reception he met with from Captain Palmer, who commanded her, was most kind. Captain Palmer immediately offered to conduct the Chanticleer into the creek, which he had named North Port Hatchett. When he made his appearance on board the brig with Captain Foster, we took him for another Robinson Crusoe in the shape of some shipwrecked mariner. He was a kind and good-hearted man; and thinking that they would be a treat to us, had brought with him a basket of albatross's eggs, which were to us a most acceptable present. How completely does this little incident, trifling as it may appear, prove the justness of Captain Hall's observations in his useful little

¹⁵³ *Narrative of a voyage*, etc., Vol. I., pages 98-99.

work entitled 'Fragments of Voyages,' that it is the time and manner of making a present that gives it all its value. * * * On the following day, under the care of Captain Palmer, the Chanticleer was safely anchored in the beautiful little harbour of North Port Hatchett."

The account by Fanning of Palmer's first two voyages and the chart and memoir of 1822 of George Powell, make it fairly certain:—1, that Palmer was probably the discoverer and certainly the first explorer of the lands lying south of Bransfield Strait and extending for some two hundred and fifty kilometers between about $57^{\circ} 50'$ and $62^{\circ} 20'$ west longitude, that is, of the northern coasts of West Antarctica from Liège Island to Joinville Island both inclusive:—2, that Palmer discovered the northern end of Gerlache Strait, which he recognized was a strait and not a bay as subsequently charted:—3, that Palmer discovered the strait or bay since called Orléans Channel:—4, that Palmer recognized that these lands were perhaps a chain of islands:—5, that this coast or these islands were christened Palmer Land and that they were so first charted in England, France and America.

It is possible, also, that Palmer may have been the first to sight the mainland of West Antarctica, although in the present state of uncertainty about the said mainland, this must be looked on as a surmise.

The position of Palmer among antarctic explorers

and also the fact that the lands first coasted along by him should bear his name, is only now beginning to be generally recognized. The Belgian expedition under de Gerlache brought this out prominently by rechristening the lands west of Gerlache Strait "Palmer Archipelago" and Mr. Henryk Arctowski,¹⁵⁴ who has helped materially in obtaining justice for Palmer, writes "Trinity island is therefore the last island of Palmer archipelago." I thought at first that the islands west of Gerlache Strait ought to be called after Dirck Gerritsz, but this is evidently a mistake, since it seems that Gerritsz never went to the Antarctic, and with proper regard to the chart and memoir of Powell and the account of Fanning, it seems as if perhaps the most just arrangement of names would be to call henceforth Anvers, Gand, Brabant, Liège and Trinity Islands "Palmer Archipelago."

Captain George Powell,¹⁵⁵ with the "Elisa" and the "Dove," arrived off the South Shetlands from the north-west on November 8, 1821. He stayed on the

¹⁵⁴ *The Geographical Journal*, London, 1901, Vol. XVIII., page 368.

¹⁵⁵ *Chart of South Shetland, including Coronation Island, from the exploration of the Sloop Dove, in the years 1821 and 1822; By George Powell, commander of the same; published by R. H. Laurie, chart seller to the Admiralty, No. 53, Fleet Street, London, Nov. 1st, 1822.*" Accompanying this is a memoir: *Notes on South Shetland, printed to accompany the chart of the*

north coast the rest of the month, catching but few seal. Finally he met Captain Nathaniel B. Palmer, with the sloop "James Monroe" at Elephant Island. He says they left there on the 4th of December, sailing west, and that they discovered land on the 6th of December, which Powell says he sighted first. The next day he landed on an island which he named Coronation Island. The "Dove" and "Monroe" then sailed along the north coast of this island. On the 11th, Powell sailed through Lewthwaite Strait, and on the same

newly discovered lands, which has been constructed from the explorations of the Sloop Dove, by her commander, George Powell; London, printed for R. H. Laurie, chart seller to the Admiralty, 1822." After much research, I found a copy of this chart and memoir at the Bibliothèque du Dépôt de la Marine, Paris. The chart is stamped with the fleur-de-lys, showing that it was in the possession of the French government before 1848; and it is therefore probable that it was bought for Dumont D'Urville himself. By the kindness of Admirals de Lanessan and Puech, and Messrs. Graz and Juttet, I obtained a photograph of the chart, of which the western half is reproduced, reduced in size, in this book.

Annales Maritimes et Coloniales etc., Paris, Imprimerie Royale, 1824; Année 1824; II^e Partie, Tome I, pages 5-25: "Extrait du Journal du voyage du capitaine Powell à South-Shetland, pendant les années 1821 et 1822." Accompanying this is a "Carte des Iles de South Shetland, y compris les îles Powell; d'après la reconnaissance du Dove dans les années 1821 et 1822; par Georges Powell, commandant du Dove": (British Museum). The chart is an exact copy, only smaller, of the original chart, with the names in French.

Journal des Voyages, découvertes et navigations modernes, ou Archives géographiques du XIX^e siècle; par J. T. Verneur, Tome Vingt-deuxième, Paris, Colnet, 1824; pages 93-111; "Extrait du journal du voyage du Capitaine Powell, à South Shetland, pendant les années 1821 et 1822": (Bib. Nat. Paris).



ORGE POWELL.

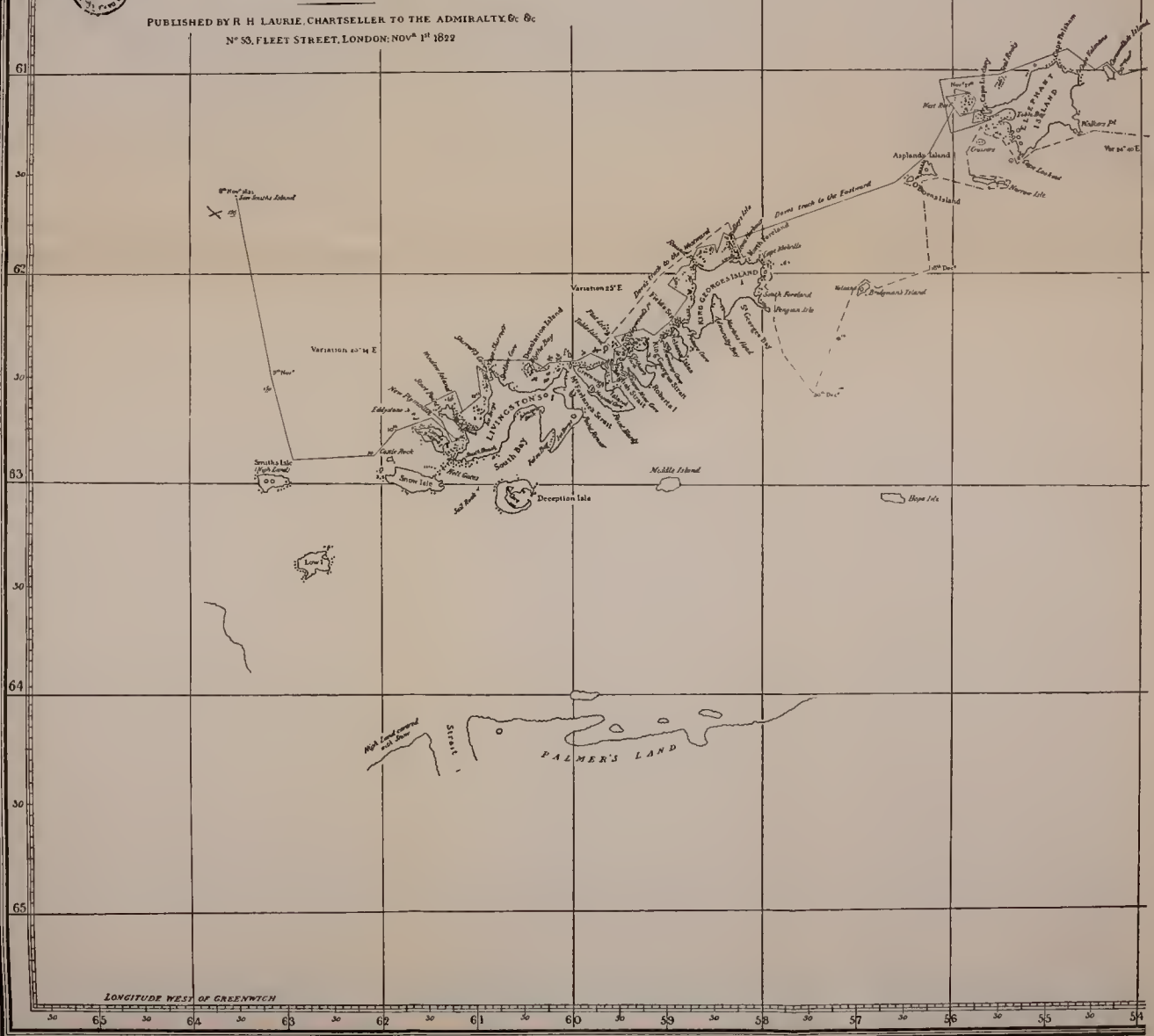
Chart
OF
SOUTH SHETLAND,
Including
CORONATION ISLAND, &c.

FROM THE EXPLORATION
Of the *Sloop Dove*, in the
YEARS 1821 AND 1822,

GEORGE POWELL,
Commander of the same



PUBLISHED BY R H LAURIE, CHARTSELLER TO THE ADMIRALTY, &c.
N° 53, FLEET STREET, LONDON; NOV^r 1st 1822



day apparently, Palmer sailed through and named Washington Strait. They returned together to Clothier's Harbor, reaching it on December 22.

Powell speaks of the ships "Dove," "Elisa," "Ann," "Grace," "Vigilant," "Mellona," "Indian," "William," "Lynx," "Nancy," and "Brusso," as having been at the South Shetlands at various times. He says also that the brig "Cora" of Liverpool was lost in Blythe Bay, Desolation Island, in 1820; and that the American vessel "Clothier" was lost in Clothier's Bay, Robert's Island (probably in 1821).¹⁵⁶

These two last mentioned papers were brought to my notice by Mr. P. Lee Phillips, Chief map division, Library of Congress: he also informs me that there is an account of the Powell Islands in Alex G. Findlay's *A directory for the navigation of the Pacific Ocean*, R. H. Laurie, London, 1851, part II., pages 658-660.

Findlay, Alex. G.: *Laurie's sailing directions for the Ethiopic or Southern Atlantic Ocean*; London, Richard Holmes Laurie, 1855: (British Museum). At pages 161-175 Findlay says that Powell's chart is the first one of these islands of West Antarctica, and that John Walker, Robert Fildes, Ralph Bond and Charles Robinson particularly assisted in making it. This book also contains, pages 171-172, a note by one of the English sealers: "Remarks on the winds, by Captain Robert Fildes, of Liverpool."

An account of Powell's life may be found in the *Biographie Universelle, Supplément*, Paris, L. G. Michaud, 1845. Jules de Blosseville, Lieutenant de Vaisseau, wrote a long appreciative notice of Powell in the *Revue des Deux Mondes*, III. année, Tome I., Paris, 1831, pages 38-46: "Mort du Capitaine Georges Powell."

¹⁵⁶Lieutenant de Gerlache (*Société Royale Belge de Géographie, Bulletin*, vingt quatrième Année, 1900, "Notes sur les

Powell's work in the Antarctic was important. Besides all the light his chart and memoir shed about Palmer Archipelago, they show also that the so-called South Orkney Islands were christened the Powell Group and were so charted originally both in England and France. This name will be found also on some early American charts: it is used, for instance, by Admiral Wilkes. It is, however, a singular fact that Powell has received more recognition from the French than from his own countrymen, by whom apparently his services to geography have been forgotten. Powell should certainly be commemorated by restoring his name—as will be done in this book at least—to the “Powell Islands.”

Captain Benjamin Pendleton made several cruises to the Antarctic. Besides what Fanning tells us¹⁵⁷ there is at least one other brief record of his voyages: “Captain Pendleton,¹⁵⁸ of Stonington, Connecticut, one of the most practical and intelligent sealers l

Expéditions” etc., page 393.) says: “During the years 1820, 1821 and 1822, seven ships were lost at the Shetlands, almost all during easterly storms. The men of one of these ships were obliged to winter on the coast; during many months, they endured the greatest privations.” This appears to be the first time anyone wintered in the Antarctic.

¹⁵⁷ See *ante* pages 85, 86, 91.

¹⁵⁸ *Executive Documents; 23d Congress, 2d Session, Doc. No. 105*; January 27, 1835: “A report of J. N. Reynolds, in relation to islands, reefs, and shoals in the Pacific Ocean” etc., (dated) New York, September 24, 1828; pages 26–27.

met with, and who has spent many years in the South Sea fur trade, is strongly of opinion that there are many valuable discoveries to be made in the seas southwest of the Shetlands. The quality of the ice, nature of the currents, etc., make his conjecture highly probable.

“The island Deception abounds with volcanoes; and there are several places where a man may stand on ice and snow, and cook his dinner in water that boils a few feet below him. On the northern part of Palmer’s Land, and in latitude 66° S., and about 63° W. longitude, Captain Pendleton discovered a bay, clear of ice, into which he run for a great distance, but did not ascertain its full extent south. In those seas the prevailing winds are from W. N. W. to W. S. W., and all gales from northeast. A gale seldom continues more than six hours. Clear weather from S. S. W. and S. S. E., which is not many days in a month.

“Captain Pendleton relates a curious fact of Deception Island. The middle of the island has been thrown up entirely by internal fires and volcanic eruptions, until the main body of the island has disappeared. In one place the melted lava ran into the ocean, leaving a passage of 15 fathoms water, over which he passed with his vessel into the centre of the island, which had the appearance of an immense bowl. He sounded without being able to find bottom.”

It would seem, from the positions given, as though Captain Pendleton must have been before Biscoe on the coast now known as Graham Land, of which he is entitled to be called the discoverer.

Captain Benjamin Morrell,¹⁵⁹ in the sealing schooner "Wasp" of Stonington, made a voyage to the Antarctic in 1822-23. He reached the Falklands on October 16th, then made a useless search for the Auroras, and afterwards steered for South Georgia. Thence he sailed for Bouvet Island, which he reached on December 6th and where he caught many seals. He gives its position as $54^{\circ} 15'$ south latitude, $6^{\circ} 11'$ east longitude. Sailing from there southward his ship was nipped on December 13th in $60^{\circ} 11'$ south latitude, $10^{\circ} 23'$ east longitude. After extricating himself, he sailed to Kerguelen Island, where he spent some time sealing. On January 11th he steered south and east, and in $62^{\circ} 27'$ south latitude, 94° east longitude, fell in with ice fields, measuring at least two hundred and forty kilometers east and west. He continued east until February 1st, when he reached $64^{\circ} 52'$ south latitude, $118^{\circ} 27'$ east longitude. The wind now came fresh from the northeast, and Morrell turned west: "being,

¹⁵⁹ "A Narrative of Four Voyages to the South Sea, North and South Pacific Ocean, Chinese Sea, Ethiopic and Southern Atlantic Ocean, Indian and Antarctic Ocean: from the year 1822 to 1831: by Capt. Benjamin Morrell, Jun.; New York, J. & J. Harper, 1832, pages 59-69: (Lib. Co., Philadelphia; Acad. Nat. Sci. Philadelphia).

however, convinced that the farther we went south beyond 64° the less ice was to be apprehended, we steered a little to the southward until we *crossed the antarctic circle*, and were in lat. $69^{\circ} 11'$ S., long. $48^{\circ} 15'$ E. In this latitude there was *no field ice*, and very few ice islands in sight." He continued steering west until, on February 23d, he crossed the meridian of Greenwich in $69^{\circ} 42'$ south latitude. He now steered north and west for Sandwich Land.

After a short stay at Sandwich Land, Morrell left there on March 8th, steering south and west. He was nearly caught by field ice, but broke through, and on March 14th reached $70^{\circ} 14'$ south latitude, $40^{\circ} 3'$ west longitude. Here the sea was free from field ice, and there were not more than a dozen ice islands in sight. The temperature of the air was 47° F., and of the water 44° F., both of which were higher than further north. Morrell also says that on the several occasions on which he crossed the antarctic circle, he found the temperature both of the air and of the water became milder the further he advanced beyond 65° south latitude.

From his most southerly point, Morrell turned northwest, giving as his reasons for not penetrating further, that he had no fuel and was short of water. On March 15th, in the afternoon "we were close in with the eastern coast of the body of land to which Captain Johnson had given the name of New South Greenland." On March 16th, the boats searched for seals on the coast, "the vessel following or keeping

abreast of them, about two miles from the land, until the next day at 4 P. M. when we were in lat. $67^{\circ} 52'$ S., long. $48^{\circ} 11' W.$ * * * The coast here tended about S. E. by S., and we thought we could discern some of the mountains of snow, about seventy-five miles to the southward. * * * On Wednesday, the 19th, we were close in with the north cape of New South Greenland; lat. $62^{\circ} 41' S.$, long. $47^{\circ} 21' W.$, by dead reckoning, not having had an observation for three days; coast tending to the south, and S. by W. * * * I would also further state, what is my firm conviction, that ice islands are never formed except in bays and other recesses of the land; and that even field ice is never produced in deep water or on a rough sea. The necessary inference, therefore, is this:—If there be no more land to the south than that with which we are generally acquainted, the antarctic seas must be much less obstructed by ice than is generally supposed; *and that a clear sea is open for voyages of discovery even to the South pole.*" Morrell then stood to the north.

It is necessary to comment rather at length on Morrell's narrative, as no antarctic voyager has been more decried.¹⁶⁰ Morrell may have reached $64^{\circ} 52'$ south latitude, $118^{\circ} 27'$ east longitude, and not seen

¹⁶⁰ Morrell has been severely assailed, for instance, by D'Urville, by Dr. Frieker, by Commander J. E. Davis, R. N., the latter in answer to Captain Hamilton, etc. (Commander Davis is the author of a paper in *The Journal of the Royal Geographical Society*, Vol. XXXIX., 1869, pages 91-95: "On Antarctic Discovery and its

Wilkes Land. He may have reached $69^{\circ} 11'$ south latitude, $48^{\circ} 15'$ east longitude and no one can say him nay, as no one else has been anywhere near that position. If he is correct, then Enderby Land is

connection with the Transit of Venus in 1882.") D'Urville and Dr. Fricker give as a reason for disbelieving in Morrell that his book is *rare*—at any rate there are two copies in the Philadelphia Library—and they also say that his book "was withdrawn soon after Biscoe's discoveries were made known," but as no authority is given for the statement, this needs confirmation. Dr. Hugh Robert Mill (*The Antarctic Manual*, London, 1901, page 533) on the other hand mentions that there were "other editions" of Morrell's book in 1841 and 1850, which scarcely looks as if the book had been withdrawn, but much more as if the edition had been sold out.

Captain (now Sir) R. V. Hamilton wrote an able defence of Morrell, (*Proceedings of the Royal Geographical Society*, 1870, Vol. XIV., pages 145-156; "On Morrell's Antarctic Voyage in the year 1823," etc.) in which he said *inter alia*, "whatever else Mr. Morrell might not have discovered, he was the first discoverer of guano in the island of Ichaboe and Lobos. The speed of 120 miles a day, with which he made the voyage, was nothing uncommon as the sea was not encumbered with ice. * * * Mr. Morrell was a sealer, not an educated man, and therefore due allowance must be made for his errors." Dr. A. Petermann (*Mitteilungen aus Justus Perthes Geographischer Anstalt*, etc., von Dr. A. Petermann, 1863, pages 407-428:—Petermann, A.: "Neue Karte der Süd Polar Regionen") appears to have believed in Morrell, for he says: "about the longitude there is probably a correction to be made of at least 5° to the west." Sir John Murray (*Scottish Geographical Magazine*, Vol. II., 1886, pages 527-548: Murray, John, Ph. D., LL. D.: "The Exploration of the Antarctic Regions") marks Morrell's positions on his map, apparently with Dr. Petermann's correction for longitude. Professor Heilprin (*Popular Science Monthly*, New York, 1897, pages 323-336: Heilprin, Professor Angelo: "Our present knowledge of the Antarctic Regions") likewise appears to consider

probably an island, and certainly the reports of the "Pagoda" and the "Valdivia" show that further exploration in that quarter is necessary.

When Morrell speaks of New South Greenland he may refer to a land which no one else, except perhaps

Morrell trustworthy. Captain A. Schüeck (*Zeitschrift für Wissenschaftliche Geographie*, Weimar 1888, pages 242-264:—A. Schüeck: "Entwicklung unserer Kenntniss der Länder im Süden von Amerika": the title of which paper proves the need of some name like West Antarctica) gives an elaborate explanation of how Morrell may have reached $70^{\circ} 14'$ south latitude, and seen the coast of West Antarctica, and yet, owing to bad chronometers or to not having any chronometers, easily have made a mistake of a good many degrees in longitude. He mentions the case of a vessel which a few years since, made an error of thirteen degrees of longitude, on the voyage between Cape Town and Australia; in a latitude where every error in a degree of longitude would mean nearly double the error perhaps made by Morrell.

About the accuracy of observations for longitude formerly made at sea, Mr. A. Fraser-Macdonald (*Our Ocean Railways*, London, Chapman & Hall, 1893, page 251) writes: "A hundred years ago ship-masters on a voyage from the British Islands to America guessed as much as calculated the place of their ships. If bound for Boston, Massachusetts, they did not by any means regard it as a bad land fall to make New York, which they frequently did, and no wonder, for their instruments of navigation erred quite as much by degrees as they now do by seconds. In fact, instances then occurred of vessels sailing across the Atlantic being from 6° to 8° and even 10° of longitude out of their reckoning in as many days from port.

"Chronometers were then but an experiment, and the tables of the Nautical Ephemeris involved errors of thirty miles in longitude in working out an observation. When the rude 'cross-staff' and 'back-staff,' the 'sea ring' and 'mariner's bow' gave place to the more accurate sextant and circle reflection, more accurate observations were secured."

Johnson, has seen. But Fanning¹⁶¹ tells us distinctly that New South Greenland was the land discovered by Pendleton and Palmer, that is, West Antarctica. There may be a land in 67° south latitude, 48° west longitude, for no one but Morrell claims to have been in that position,¹⁶² but there may also have been a mistake in Morrell's published longitudes, and this may have arisen in one of two ways. He was a sealer, and it is not likely that he had a chronometer or even an ordinary watch which was reliable, and he therefore might easily have made, and probably he did make, errors in his observations. Again, his book is a bad, cheap and careless piece of typography, and the figure 4 may simply have been substituted for the figure 5: 48° for 58°.

If Fanning's remark is accurate, and if New South Greenland is West Antarctica, part of Morrell's narra-

¹⁶¹ See *post*, page 108.

¹⁶² Signor Faustino (*Bolletino Società Geografica Italiana*, Roma, 1901, Serie IV, Vol. II, pages 653-658:—Faustino, A.: "La Groenlandia del Sud": Acad. Nat. Sci. Philadelphia) in an unprejudiced, sensible paper, shows that there may be land in 48° west longitude, 67° south latitude as Morrell states.

Vivien de Saint Martin (Vivien de Saint-Martin et Fr. Schrader: *Atlas Universel de Géographie*, Paris, Hachette; Chart "Région polaire antarctique" imprimé par Ch. Chardon, 1883: Harvard Univ. Lib.) charts "Groenland Mer¹" in 48° west longitude, 67° south latitude; Morrell's course also is laid through Budd Land, Knox Land, and Termination Land, oblivious of the fact that Morrell does not give his course except in the most general terms. On the same chart also, "Côte Clarie" is, as usual, placed on Cape Carr: otherwise all the names given by Wilkes are there.

tive at least becomes fairly clear. The two phrases, on March 15th and 16th, "we were close in with the eastern coast" and "the coast here tended about S. E. by S.," are noteworthy. For how did Morrell know that there was an eastern coast, if he had not been there? There may be an earlier mention of the eastern coast than that of Morrell, published in 1832, but if so, I have not come across it. The eastern coast of West Antarctica is not marked on Powell's chart, on Weddell's chart, on Vandermaelen's atlas,¹⁶³ or on D'Urville's chart. D'Urville¹⁶⁴ states that he ran over 62° 41' south latitude, 47° 21' west longitude, and, therefore, he claims that New South Greenland has no existence. Of course this may be the case, but it seems more likely that Morrell's northern point was Joinville Island.

Morrell's narrative is decidedly vague, but then so are the narratives of many antarctic voyagers, witness Bransfield, Foxton, Dallmann, etc. Although Morrell's work is of little value as a geographic record, yet it should be noted how sensible and scientific is his explanation, quoted above, of the formation of icebergs and field ice: in fact it is probably the best explanation offered up to the date of its publication. A comparison, for instance, of Morrell's

¹⁶³ Vandermaelen, Ph.: *Atlas Universel de Géographie*, Bruxelles, 1827: (Library of Congress).

¹⁶⁴ *Voyage au Pôle Sud*, etc., Vol. II., 1842, pages 16, 17.

accurate theory, with Biscoe's erroneous theory¹⁶⁵ shows instantly how superior to Biscoe, Morrell was as a scientific observer. In judging Morrell's antarctic record, it should be remembered that he was a sealer and not a scientist, that he had no instruments of precision, that the summer of 1823 was the most open in antarctic annals, and that even then Morrell does not claim to have reached as high a southern latitude as Weddell in the same year.

Captain Robert Johnson, in 1822, made a sealing cruise in the schooner "Henry" of New York. Captain Morrell writes about him;¹⁶⁶ "The schooner 'Henry,' Captain Johnson, who had been vainly cruising for six weeks in search of the Aurora Islands, returned to New Island on Wednesday, the 23d. (Note. The history of these *imaginary* islands will be found on a subsequent page.)" And later: "March 15th, * * * At this time the wind had hauled to the southwest, and at half-past four P. M. we were close in with the eastern coast of the land to which Captain Johnson had given the name of New South Greenland."¹⁶⁷

Edmund Fanning also speaks of Captain Johnson:¹⁶⁸

¹⁶⁵ See *post*, pages 119, 120.

¹⁶⁶ *A Narrative of Four Voyages*, etc., page 53.

¹⁶⁷ *A Narrative of Four Voyages*, etc., page 69.

¹⁶⁸ *Voyages Round the World*, etc., page 437.

“This continent, it is asserted in Morrell’s voyage, page 69, was named ‘New South Greenland’ by a Captain Johnson. It is but just to state here, that this most meritorious mariner (Captain Johnson) was a pupil to, and made his first voyage to the South Seas with the author, with whom also he remained, rising to different stations, and finally became one of his best officers; the first information he obtained of the discovery of this land by Captains Pendleton and Palmer was from the author of this work.”

Captain Johnson made another cruise in the year 1824 or 1826. “From this voyage he never returned. He was last seen at the South Cape of New Zealand, in the following year, having lost three men, who were drowned at Chatham Islands. * * * My informants further stated, that the “Henry” left New Zealand on a cruise to the south and east, in search of new lands, between the sixtieth and sixty-fifth degrees of south latitude; and as he has never been heard of since leaving New Zealand, it is very probable that he made discovery of some new island near the parallel of 60 on which the “Henry” was shipwrecked.”¹⁶⁹

American sealers, besides those whose names are recorded, certainly made journeys to the Antarctic in the first quarter of the nineteenth century. Mr. J. N.

¹⁶⁹ *A Narrative of Four Voyages*, etc., pages XXIII. and 363.

Reynolds tells us:¹⁷⁰ "The information I have thus far communicated has been derived chiefly from our citizens engaged or interested in the whale fishery. I regret that I am not at liberty to communicate in writing all the interesting facts which I have been enabled to collect from those engaged in the seal trade, or, as they call it, 'the skinning business.' The occupation of these men leads them into seas and parts of the globe far beyond the common pathway of the whaler. Their voyages and adventures, too, are of the most daring kind. In small vessels they venture into high southern latitudes, and have actually taken seal, with profit, in some instances, within the antarctic circle. In the history of the seal trade, secrecy in what they know, has been deemed a part, and a very important part too, of their capital. There is nothing more common at this time, than that islands are frequented for animal fur, and their positions known to no one on board but the captain; and when an island is discovered, the observations are made and noted down by the captain in his private journal.

"* * * I have been enabled to make the following estimate :

"That they have been beyond 70° S. latitude in a few instances, in which latitude they experienced

¹⁷⁰ *Executive Documents, 23d Congress, 2d Session, Doc. No. 105*; January 27, 1835 "A report of J. N. Reynolds, in relation to islands, reefs and shoals in the Pacific Ocean," etc., (dated) New York, September 24, 1828; pages 25, 26.

moderate weather, a clear sea, and no land or ice to the south. They all agree that the ice to be met with is first formed and attached to land, and that the greatest impediment to navigation from ice will be found from 62° to 68° S., except in those meridians where they have not been able to go far south at any time. They have seen lands to the east of the Shetlands, but give no account of any animal or vegetable productions on any of them.

“The southern part of the New South Shetlands extends farther than any one has yet penetrated. The shores are bold and in many places afford spacious harbors, which look as if they might extend far into land, like Hudson’s or Baffin’s Bay.

“In latitude 63° S., and 63° W. longitude, from the island Pigsaw, our sealers have sailed along a high and rugged coast, tending S. W. to 75° W. longitude, and 66° S. latitude,” etc.

The last paragraph is practically conclusive evidence that, before the year 1828, American sealers had sailed along the coast of Graham Land and probably as far as Alexander Land.

Captain Weddell¹⁷¹ made numerous sealing voyages in 1820–1823. He searched for the Aurora

¹⁷¹ Weddell, James, Esq., master in the Royal Navy: *A Voyage towards the South Pole*, performed in the years 1822–24: London, Longman, Hurst, Rees, Orme, Brown and Green, 1825: (Lib. Co. Philadelphia).

Islands, and concluded that they were really the Shag Rocks, in $53^{\circ} 48'$ south latitude, $43^{\circ} 25'$ west longitude. He visited the South Shetlands several times and called one of them Smith's Island and another James' Island: from his chart, he appears to have been only on their north or eastern shores.

In February 1823, Weddell, in the brig "Jane," and Mr. Matthew Brisbane, in the cutter "Beaufoy," made an important southern cruise. Standing south on the 4th of February, they were deceived by great ice islands into thinking they had sighted land. On the 14th, in $68^{\circ} 28'$ south latitude, $29^{\circ} 43'$ west longitude, the ice islands were so numerous as almost to prevent the ships passing. On the 16th, on the contrary, in $70^{\circ} 26'$ south latitude, $29^{\circ} 58'$ west longitude, "ice islands had almost disappeared, and the weather became very pleasant."¹⁷² On the 18th the ships were in $72^{\circ} 38'$ south latitude. "In the evening we had many whales about the ship, and the sea was literally covered with birds of the blue peterel kind. *Not a par-*

Weddell, James, master in the Royal Navy: *Observations on the probability of Reaching the South Pole*, London, Longman, Rees, Orme, Brown and Green, 1826: (Acad. Nat. Sci. Philadelphia).

Weddell, James, etc.: *A Voyage towards the South Pole*, etc., London, Longman, etc., 1827: This contains also "Observations on the probability of reaching the South Pole" and "Second Voyage of the Beaufoy to Tierra del Fuego": (Acad. Nat. Sci. Philadelphia). The Beaufoy was under the command of Mr. Brisbane and did not go to the Antarctic during this journey.

¹⁷² *A Voyage*, etc., page 34.

tide of ice of any description was to be seen. The evening was mild and serene."¹⁷³ On the 19th the ships were in $73^{\circ} 17'$ south latitude, $35^{\circ} 54'$ west longitude. On the 20th: "At 10 o'clock in the forenoon, when the ship's head was E. S. E., I took a set of azimuths, which gave variation $11^{\circ} 20'$ east. The atmosphere now became very clear, and nothing like land was to be seen. Three ice islands were in sight from the deck, and one other from the masthead. On one we perceived a great number of penguins roosted. Our latitude at this time, 20th February, 1822, was $74^{\circ} 15'$, and longitude $34^{\circ} 16' 45''$; the wind blowing fresh at south, prevented, what I most desired, our making further progress in that direction. I would willingly have explored the S. W. quarter, but taking into consideration the lateness of the season, and that we had to pass homeward through 1000 miles of sea strewed with ice islands, with long nights and probably attended with fogs, I could not determine otherwise than to take advantage of this favourable wind for returning."¹⁷⁴ * * * These considerations induce me to conclude, that from having but three ice islands in sight, in latitude 74 degrees, the range of land, of which I have spoken, does not extend more southerly than the 73d degree. If this be true, and if there be no more land to the southward, the antarctic polar sea may be found less

¹⁷³ *A Voyage*, etc., page 36.

¹⁷⁴ *A Voyage*, etc., page 37.

icy than is imagined, and a clear field of discovery, even to the South Pole, may therefore be anticipated."¹⁷⁵ Captain Weddell then sailed northward, on a course not far distant from his southerly one. His southern cruise is interesting, and what he says about warmer weather and little ice far south, agrees with what Morrell reports of the same season. Weddell called his open sea "George IV. Sea": a better name for it would be "Weddell Sea," but it is questionable whether a local name will be applied to a portion of the Atlantic Ocean.

Morrell wrote a brief notice of Weddell, about whom he says:¹⁷⁶ "Captain James Weddell, of the British Navy, whom I have before mentioned in the previous chapter, as seeking for the Aurora Islands, in 1822: a most excellent officer, and a highly worthy man: justly extolled as an active, correct and enterprising navigator. Being familiar with danger in its most appalling form, every emergency finds him cool, steady and undaunted. He is, in short, at once an honour to his country and to human nature. I speak with confidence, for I know him."¹⁷⁷

¹⁷⁵ *A Voyage*, etc., page 43.

¹⁷⁶ *A Narrative of Four Voyages*, etc., page 68.

¹⁷⁷ Several writers, among them Dumont D'Urville, (*Voyage au Pôle Sud*, etc., Vol. II, page 123) and Captain Schück (*Zeitschrift für wissenschaftliche Geographie*, Weimar, 1888; pages 242-264:—A. Schück: "Entwicklung unserer Kenntniss der Länder im Süden von Amerika") discuss Weddell's voyage, and for various reasons, criticise rather severely his narrative. Monsieur de Mon-

A Captain Hoseason, according to D'Urville,¹⁷⁸ may have made discoveries in West Antarctica. D'Urville says: "However, on the map of the Englishman Laurie, one saw Palmer Land stretch out east and west to a notable extent. In the east the outline remained quite vague and confused, but in the west one saw drawn a considerable bight under the name of Hughes Bay, with Hoseason, Intercurrence and Three Hummocks islands, and Point Farewell. No document has reached us about the author of these discoveries; only, from an indication to be found on this map, we are led to think that a certain Captain Hoseason had, during the year 1824, made these discoveries, while seeking new lands suitable for seal fishing."

Captain Norris,¹⁷⁹ with the "Sprightly" and "Lively," belonging to Messrs. Enderby, on De-

travel, of D'Urville's expedition, goes so far as to write (*Voyage au Pôle Sud*, Vol. II., pages 301-303) of Weddell "dont je regarde le voyage comme apocryphe."

¹⁷⁸ *Voyage au Pôle Sud*, etc., Vol. II., page 20. The map referred to is evidently not Powell's chart. It may or may not be the map mentioned by D'Urville as giving Bransfield's discoveries. It seems well, however, to call attention to the fact that on Powell's chart of 1822, the outline of Palmer Land, from Liège Island to Joinville Island, both inclusive, is perfectly clear and neither vague nor confused.

On the chart published in connection with Mr. Smith's voyage (*The Edinburgh Philosophical Journal*, Vol. III., 1820) there is a small island called "Hoseason's Aim."

¹⁷⁹ Ross, Sir J. C. : *Voyage*, etc., Vol. II., pages 371, 372.

ember 10th, 1825, sighted an island in $54^{\circ} 15'$ south latitude, 5° east longitude. He called it Liverpool Island, but it is doubtless Bouvet Island. On the 13th, he sighted another small island in $53^{\circ} 56'$ south latitude, $5^{\circ} 30'$ east longitude, which he called Thompson Island.

Captain Henry Foster, R. N., in 1828–1829, commanded an expedition to the South Shetlands¹⁸⁰ for the purpose of making pendulum observations. After stopping at Staaten Land, where he met Captain Nathaniel B. Palmer, he sailed to the Shetlands and beyond to a place in $63^{\circ} 43'$ south latitude, $61^{\circ} 45'$ west longitude, which he named Possession Cape¹⁸¹ and on which he landed. Lieutenant Kendal thinks this was a new discovery, but he is clearly in error. The “Chanticleer” was then moored in the harbor (Yankee

¹⁸⁰ *Narrative of a Voyage to the Southern Atlantic Ocean*, in the years 1828–29–30, performed in H. M. Sloop *Chanticleer*, under the command of the late Captain Henry Foster, F. R. S., etc. : from the private journal of W. H. B. Webster, Surgeon of the Sloop : London, Richard Bentley, 1834 : (Lib. Co. Philadelphia).

The Journal of the Royal Geographical Society of London, for MDCCCXXX–XXXI., London, MDCCCXXXI. : VI.—“Account of the Island of Deception, one of the New Shetland Isles” : Extracted from the private journal of Lieutenant Kendal, R. N., embarked on board His Majesty’s Sloop *Chanticleer*, Captain Forster (*sic*), on a scientific voyage ; and communicated by John Barrow, Esq., F. R. S. : read 24th January, 1831.

¹⁸¹ This is what is now known as Hoseason Island : it is indicated on Powell’s chart of 1822.

Harbor) of Deception Island on January 9th, 1829, and remained there until March 4th, and during her stay numerous pendulum observations were made. The island is volcanic: some of the mountain peaks emitted smoke; and numerous hot springs bubbled up on the shores and the beaches.¹⁸² Dr. Webster and Dr. Peter Conolan studied the fauna and flora of Deception Island.¹⁸³ They were much struck with the enormous abdominal vein of the leopard-seals.

Dr. Webster says of icebergs:¹⁸⁴ "Having made some experiments of this nature, I deduced from them that in cubic pieces of ice one-seventh part only remained above the surface of the water. I also placed a cone of ice on a cubic piece from the same iceberg, and found that the cube easily floated and sustained the little pyramid, the height of which was more than double the depth of the cube below the water. I also floated irregular-shaped masses, and found their heights above the surface to vary considerably; in some it was equal, in others greater than the depth below it; proving that no inference can be safely drawn as to the depth to which an iceberg extends from the surface with reference to its height above it, and that all depends on its form. * * * In cor-

¹⁸² *Narrative of a Voyage*, etc., Vol. I., pages 144-168; Vol. II., pages 273-280.

¹⁸³ *Narrative of a Voyage*, etc., Vol. II., pages 300-306.

¹⁸⁴ *Narrative of a Voyage*, etc., Vol. I., pages 142-143.

roboration of this I may further observe, that while we were in contact with the iceberg off the island, we determined its height by a reference to the vessel's mast to be not less than fifty feet. Now this would have required a depth of three hundred and fifty feet to float in, according to the conclusion deduced from a cubical piece; but it was floating in ninety-six feet; for we obtained soundings at the same time with sixteen fathoms of line." These observations of Dr. Webster deserve to be better known, for even to-day, apparently, it is often believed that the height of an iceberg above water is six or seven times less than its depth under water; and Dr. Webster, it would seem, was the first to note that this was not always the case.

Captain James Brown,¹⁸⁵ an American sealer, made a southern voyage in 1829-1831 in the schooner "Pacific." He reported sighting four islands which, at the time, were not charted. The first, in $56^{\circ} 18'$ south latitude, $28^{\circ} 35'$ west longitude, he called Potter's Island. The second, in $55^{\circ} 55'$ south latitude, $27^{\circ} 53'$ west longitude, he named Prince's Island. The third, in $56^{\circ} 25'$ south latitude, $27^{\circ} 43'$ west longitude, he christened Willey's Island; and the fourth, in $57^{\circ} 49'$ south latitude, $27^{\circ} 38'$ west longitude, he called Christmas Island.

¹⁸⁵ Fanning, Edmund: *Voyages Round the World*, etc., pages 440-442.

Mr. John Biscoe,¹⁸⁶ in 1830-1832, with the brig "Tula" and the cutter "Lively," both ships belonging to the Messrs. Enderby, circumnavigated Antarctica, sailing eastward. In November, 1830, he searched in vain for the Aurora Islands. On January 7th, 1831, in $59^{\circ} 35'$ south latitude, $20^{\circ} 21'$ west longitude, Biscoe was stopped by smooth pack ice, which seemed to have been formed at sea; "nevertheless there were strong indications of land in the southwest." On the 21st, in $66^{\circ} 16'$ south latitude, $0^{\circ} 24'$ west longitude, there were many indications of land to the south and southeast. On February 1st, Biscoe was in $68^{\circ} 51'$ south latitude, $12^{\circ} 22'$ east longitude, and on the 25th, in $66^{\circ} 2'$ south latitude, $43^{\circ} 54'$ east longitude, where he "saw a very distinct appearance of land." "At length, on the 27th, in lat. $65^{\circ} 57'$ S., long. $47^{\circ} 20'$ E., land was distinctly seen, of considerable extent, but closely bound with field ice." Efforts were made to

¹⁸⁶ *The Journal of the Royal Geographical Society of London*, Volume the Third, 1833, pages 105-112:—VIII.,—"Recent Discoveries in the Antarctic Ocean": From the Log-book of the Brig Tula, commanded by Mr. John Biscoe, R. N.: Communicated by Messrs. Enderby: Read, 11th February, 1833.

The Nautical Magazine for 1835, Vol. IV., Simpkin and Marshall, London, pages 265-275: "Voyage of the Tula towards the South Pole."

The Antarctic Manual, London, Royal Geographical Society, 1901, pages 305-335: "From the Journal of a Voyage towards the South Pole on board the brig Tula, under the command of John Biscoe, with the cutter 'Lively' in company."

It is not clear from the accounts, whether a Captain Avery or a Captain Weddell was in command of the "Lively."

close with the land, but owing to heavy gales the ships were driven off. On March 16th, however, "nearly the same land was again made; the longitude being now 49° E. A head-land, previously seen, was recognized, and called Cape Ann; and unceasing efforts were made, for some days, to approach nearer it, but all in vain." On April 6th, Captain Biscoe finally turned north "never having approached this forbidden land (which has, with great propriety, been called Enderby's Land), nearer than from twenty to thirty miles." Biscoe and his men suffered many hardships on this most creditable voyage.

Biscoe's ideas about the formation of icebergs are the exact opposite of the accepted views on the subject, although it must be added that he wrote at a time when practically nothing was known of glacier motion: it seems evident also, from the following passage, that he had no suspicion of the probable existence of an antarctic continent. Biscoe writes: ¹⁸⁷ "But of all the icebergs I have seen, which are many hundreds, I could never discern the least trace of their having ever been connected with land, and had formed the opinion in my mind that they originated from a vast body of ice, frozen on the surface of the water, and accumulating with time, and I should have regretted much had I been obliged to leave these southern parallels, from the advanced state of the season, without satisfying

¹⁸⁷ *The Antarctic Manual*, London, 1901, pages 320, 321.

myself in this particular, and having seen nothing but the field ice. However, this morning has completely satisfied me in this respect, for I have not the least doubt that the whole spaces, from the latitudes I have visited to the Pole, are one solid mass; land may intervene, or winds, where they are strong and prevalent, may have prevented its forming in some parts more than others * * * As to the icebergs being formed on shore, I do not think it possible or probable for this reason, their own weight would prevent their accumulating on any prominent part of land. It would break off at different times and form what is called field-ice, for should it once become so extensive a mass as an iceberg, and which could only be when there was shallow water, it is utterly impossible it could ever separate from the land where it was first formed, as it is well known that ice swims at least two-thirds under water," etc.

Biscoe sailed again south from New Zealand in January, 1832. He bore away southeast. On the 25th, he was in $60^{\circ} 45'$ south latitude, $132^{\circ} 7'$ west longitude; on February 3d, in $65^{\circ} 32'$ south latitude, $114^{\circ} 9'$ west longitude; and on the 12th, in $66^{\circ} 27'$ south latitude, $81^{\circ} 50'$ west longitude; in all of which positions much ice was seen. On February 15th, in $67^{\circ} 1'$ south latitude, $71^{\circ} 48'$ west longitude, land was seen; this was called Adelaide Island; "and in the course of the ensuing fortnight, it was further made

out to be the westernmost of a chain of islands, lying E. N. E. and W. S. W., and fronting a high continuous land, since called Graham's Land, which Captain Biscoe believes to be of great extent. The range of islands has been also since called Biscoe's Range, after the discoverer."¹⁸⁸ "On the 21st of February Captain Biscoe succeeded in landing on what he calls the main land." The mountains here were named Mount Moberly and Mount William, the latter in 64° 45' south latitude, 63° 51' west longitude. Biscoe then repaired to the South Shetlands, where he met the schooner "Exquisite" of London, Captain Kellock, and Biscoe afterwards returned to England.¹⁸⁹

Lieutenant Rea,¹⁹⁰ R. N., in 1832-1833, set out with two ships belonging to the Messrs. Enderby, to continue Biscoe's researches. Biscoe was to command the expedition, but he could not go. Lieutenant Rea did not get beyond the South Shetlands, where

¹⁸⁸ Graham Land would appear to have been reached before the year 1828, by Captain Benjamin Pendleton. See *ante*, page 99.

¹⁸⁹ *Maps of the Society for the Diffusion of Useful Knowledge*, vol. I., London, Chapman & Hall, 1844: (Harvard Univ. Lib.). Map "No. 6, Circumjacent the South Pole" Baldwin and Cradock, 1831, shows "I. of Peter, I. of Alexander, Palmer's Land." It goes to show that the English nomenclature of West Antarctica was accurate and just until the voyage of Biscoe.

¹⁹⁰ Dumont D'Urville: *Voyage au Pôle Sud*, Vol. II., page 25. D'Urville says he got his information from Biscoe himself.

The Antarctic Manual, London, 1901, page 519.

one of his ships was crushed, while the other barely escaped a similar fate.

Lieutenant Binstead, R. N., with the "Hopewell," Mr. Foxton navigating officer,¹⁹¹ and the "Rose," left the Falkland Islands at the end of December, 1833, and sailed south in between about 10° and 20° west longitude. The ships were beset with icebergs in 65° south latitude, but escaped, and "as we approached 70 degrees south we saw high land covered with snow, and in our endeavor to approach it we became again blocked in." The "Rose" soon after was crushed and sank, but the crew escaped to the "Hopewell," which then returned to the Falkland Islands, reaching them at the end of February, 1834.

The land sighted on this voyage does not seem to be charted.¹⁹² The reminiscences of Mr. Foxton, written from memory sixty years after the event, are necessarily vague, and there may easily be some error in

¹⁹¹ *Transactions of the Royal Geographical Society of Australasia, Victorian Branch*, Melbourne, Vol. X., 1893, pages 58-62 :—Foxton, J. G. : "Notes on a long forgotten Antarctic voyage in 1833" : (Amer. Phil. Soc.).

¹⁹² This land must lie somewhere near the spot to which Sir James Clark Ross penetrated in March 1843 ; and it would seem as though he must have known of Binstead's discovery, since the latter was an officer in the Royal Navy. Ross, however, does not mark this land on his charts, and, judging from his general habits in that respect, this omission might be cited as an *a priori* proof of the existence of "Binstead-Foxton Land."

the longitude, still his account is noteworthy because it seems to be the only report of land in that portion of the Antarctic, and it is a strong hint that the continental mass may not be so far south there as is generally assumed.

In 1833, an English sealer, named Kemp, is reported to have sighted land just east of Enderby Land, and it is marked "Kemp Land" on most atlases. Although Kemp's course is laid down on the English Admiralty charts, there is, apparently, no published account of his journey.¹⁹³

¹⁹³ The sum total of added knowledge in these sixty years, judging from Hugh Murray's *The Encyclopædia of Geography* (Philadelphia, Carey, Lea and Blanchard, 1837, Vol. III., pages 172-173), had led to a general belief in 1837, that round the South Pole was an archipelago of islands, and not a continental mass. Murray refers to the Antarctic under the title "South Polar Islands," and begins: "The Islands of the Southern Polar Sea, to which Monsieur Balbi gives the somewhat too pompous title of Antarctic Archipelago, extending chiefly," etc. He says also: "In 1831, Captain Biscoe fell in with land, in 66° S. lat. and 47° E. long., to which he gave the name of Enderby Land, and which he conceives to be of considerable extent. In the following year, he touched upon another coast of uncertain extent, in about the same latitude, and in long. 70° W. To this latter tract has been given the name of Graham Land." This paragraph of Murray's is interesting, for it proves that the discovery of Enderby Land did not, at the time, give to geographers any idea of a South Polar Continent, but only that another island had been found. My attention was called to Murray's work by Mr. Edward E. Hale's *Stories of Discovery*, Boston, Roberts Brothers, 1887.

Mr. John Balleny, an English sealer, sailed from Chalky Bay, New Zealand, on January 7th, 1839, with the schooner "Eliza Scott," and the cutter "Sabrina."¹⁹⁴ He worked his way south, westward of 170° east longitude, and on February 1st was in 69° south latitude, 172° 11' east longitude, where the pack was so thick that he turned north. On February 9th, he discovered three islands in 66° 22' south latitude, 163° 49' east longitude, landed on one of them on February 12th, and found that it was volcanic in origin.

From these islands, since appropriately called the Balleny Islands, Balleny worked up northward and then westward. He met with a good deal of ice.

McNab's "Log" says on February 26: "At 8 it cleared off a little to the N. E. Thought we saw the land: tacked and stood for it. At 11.30, made it out to be fog hanging over some iceberg. At noon, ditto

¹⁹⁴ *The Journal of the Royal Geographical Society of London*, Volume the Ninth, 1839, pages 517-528, VI.: "Discoveries in the Antarctic Ocean, in February, 1839": Extracted from the Journal of the Schooner "Eliza Scott," commanded by Mr. John Balleny: communicated by Charles Enderby, Esq.

A brief note about the claims of Balleny as a discoverer is found in *Proceedings of the Royal Geographical Society of London*, Vol. II., 1858, pages 171, 172:—Charles Enderby: "Note on Sabrina Land," etc.

The Antarctic Manual, London, Royal Geographical Society, 1901, pages 348-359: "Extract from the Log of the Schooner 'Eliza Scott,' Captain John Balleny, while S. of 55° S. Latitude, kept by John McNab, Second Mate."

weather. Latitude, observation, $64^{\circ} 40'$ S. ; longitude by account, $131^{\circ} 35'$ E. Thick fog, with snow and sleet."

Balleny's "Journal" says :—

"*March 1st.*—With a steady breeze from the S. E. continued standing to the westward—passed several icebergs, and numerous flocks of penguins, petrels, and mutton birds.

"*March 2nd, A. M.*—Squally from the S. E., with snow and sleet. At 8 cleared off a little. At noon, lat. obs. $64^{\circ} 58'$, long. $121^{\circ} 8'$, therm. 35° . P. M., Strong winds, and showers of snow and sleet; saw a great many birds. At 8, the water becoming smooth all at once, shortened sail, and hove-to. Saw land to the southward, the vessel surrounded by drift ice. At midnight strong breezes with snow.

"*March 3rd, A. M.*—Found the ice closing and becoming more compact; stood through the drift ice to the southward. At 8 h. found ourselves surrounded by icebergs of immense size; to the S. W. the ice was quite fast, with every appearance of land at the back of it, but the weather coming on thick, were obliged to steer to the northward along the edge of the pack. At noon, lat. by obs. $65^{\circ} 10'$, long. $117^{\circ} 4'$. P. M., Fresh breezes from the S. S. E. and clear; numerous icebergs in sight."

The three sentences: "Thought we saw the land," "saw land to the southward" and "the ice was quite fast, with every appearance of land at the back of it,"

are the only references to the great mass of land south of Australia. Balleny never suggested nor probably even suspected that he was on the edge of a continent, or that he had sighted anything but another island. That no one in England, at the time, thought the matter of any importance is shown by the fact that the editor of *The Journal of the Royal Geographical Society* placed as running heading at the top of page 525: "Sturge Island—Brown's Peak—Borradaile Island." Three of the Balleny Isles! There is nothing about Sabrina Land! This does not, however, alter the fact, and there appears to be no doubt that Balleny had a glimpse of the mainland of East Antarctica.

Balleny continued on a westerly course. On March 13th he wrote: "Light variable winds from the eastward; surrounded by icebergs: in lat. 61° , long. $103^{\circ} 40'$, passed within a $\frac{1}{4}$ of a mile of an iceberg about 300 feet high, with a block of rock attached to it."¹⁹⁵

¹⁹⁵ *The Journal of the Royal Geographical Society of London*, Vol. the Ninth, 1839, pages 528-529:—Charles Darwin: VI. "Note on a Rock seen on an Iceberg in 61° South Latitude." Darwin thinks such transported boulders are rare in the Antarctic, but that nevertheless, "the bottom of the Antarctic Sea, and the shores of its islands, must already be scattered with masses of foreign rock,—the counterpart of the 'erratic boulders' of the northern hemisphere." Darwin mentions Sabrina Land—named after the cutter, which I believe was lost on the home voyage—and thus proves that the name was given shortly after the return of Balleny to England: "The part of the ocean where the iceberg was seen is 450 miles distant from *Sabrina* land (if such land exists), and 1400 miles from any certainly known land."

About this his editor commented as follows: "We will, therefore, only add that this iceberg was distant 1400 miles from the nearest *certainly-known* land, namely, Enderby's Land, which bore W. S. W. of it. But it is highly probable from the compact nature of the ice, etc., that land extends between the parallels of 66° and 68° S., in which case the iceberg would not be distant above 300 miles from this supposed land. The appearance of land seen by Captain Balleny on the 3rd of March, as above mentioned, bore from the iceberg E. S. E., distant 450 miles." Balleny then returned to England, apparently without making any stops, so that his discovery could not have been known to either Wilkes or D'Urville when they sailed.

Captain Jules Sébastien César Dumont-D'Urville¹⁹⁶ in January, 1838, with the "Astrolabe" and Captain Jacquinot, with the "Zélée," sailed southward from the Strait of Magalhaës. On January 15th, they found the first icebergs, in about 59° 30' south latitude. On January 22d, in about 64° south latitude, due south of the Powell Islands, they were stopped by an icy barrier extending along the entire horizon.

¹⁹⁶ *Voyage au Pôle Sud et dans l'Océanie, sur les corvettes l'Astrolabe et la Zélée*, sous le commandement de M. J. Dumont-D'Urville, capitaine de vaisseau: Publié par ordonnance de Sa Majesté, sous la direction supérieure de M. Jacquinot, capitaine de vaisseau: Paris, Gide et Cie., éditeurs, 1845-1847, etc.: (Acad. Nat. Sci., Philadelphia; Pub. Lib., Boston).

The *corvettes* followed the line of the pack for more than two hundred kilometers, coming back to 61° south latitude, north of the Powell Islands. D'Urville wished to follow the tracks of Weddell, and, therefore, turned once more southeast, when he again met an icy barrier between 62° and 63° south latitude. In trying to break through the pack, the vessels were nipped, and for five days were in a good deal of danger. Finally, a strong southerly gale opened the pack somewhat, and with the help of saws and axes, they succeeded in breaking loose. On February 15th, D'Urville returned westward, examined again the Powell Islands and some of the Shetlands, and then succeeded in getting a little further south, where between 63° and 64° south latitude he sailed over a hundred kilometers along the coast of Palmer Land, which he renamed Louis-Phillippe Land and Joinville Land, although it had been previously visited by Palmer and Johnson, and the entire northern coast charted with some accuracy, from the reports of Palmer, by Powell. Scurvy having broken out on D'Urville's ships, he then returned north.

D'Urville mixed up the nomenclature of West Antarctica. He simply wrote Trinity Land on Palmer Land, and moved Palmer Land into Gerlache Strait, so as to get room for his own names. It has been already explained that as Palmer was the first on this coast, his name ought certainly to be com-

memorated. It is also reasonably certain that Robert Johnson and other sealers had visited portions of this coast. The names given by D'Urville, however, of Joinville Island, Orléans Channel¹⁹⁷ and Louis Phillippe Land will probably endure: the latter extending from Joinville Island to about Orléans Channel, that is to the eastern extremity of Palmer Archipelago, and by general agreement south to Cape Foster and Cape Seymour.

Two years later, D'Urville made another cruise south.¹⁹⁸ He started from Hobart Town on January 1st, 1840. On January 16th the watch signalled the first ice; on the 18th, they had reached 64° south latitude; on the morning of the 19th, six enormous ice islands were floating round them; finally, about three o'clock on the afternoon of the 19th, Monsieur Gervaise, who was on watch, noticed "a grey spot, which appeared stationary,"¹⁹⁹ but already we had so often been led into error by these false appearances, so frequent in these regions, that we had become very suspicious. Monsieur Dumoulin, who was on deck, occupied at that instant in charting the various ice-islands which were in sight, hastened to ascend the rigging so as to clear up all doubts; he assured himself that the indications noted by Monsieur Gervaise

¹⁹⁷ Orléans Channel was discovered by Palmer and charted by Powell. See *ante*, page 94.

¹⁹⁸ *Voyage au Pôle Sud*, etc., Tome Huitième, pages 123-185.

¹⁹⁹ *Voyage au Pôle Sud*, etc., Tome Huitième, page 136.

had reference to a cloud, which, seen from the height of the mizzen top, appeared to be above the horizon. On descending, he announced to me besides, that straight in front of us, there was an appearance of land much more distinct and more noticeable ; it was, in fact, Adélie Land. Thanks to this circumstance, Monsieur Dumoulin was the first one of us all who saw the land."

On the 20th, owing to lack of wind, they could not get any nearer to the coast, and there remained, on the "Astrolabe," more than one doubter as to its existence. But at midday all uncertainty ceased, as a boat sent from the "Zélée," announced that since the day before they also had seen land. On the 21st, a light wind enabled the ships to close in with the shore. As they progressed, ice islands became more numerous, and by eight o'clock the *corvettes* were so hemmed in by these enormous masses of ice, that D'Urville feared every instant seeing his ships wrecked. During the day, however, they worked their way through until they were in a small (Piner) bay :

"The land which was in sight now showed us the few accidents it presented:²⁰⁰ it stretched as far as the eye could see to the southeast and to the northwest, and in these two directions we could not see its limits. It was entirely covered with snow, and it might have a height of 1000

²⁰⁰ *Voyage au Pôle Sud*, etc., Tome Huitième, pages 143-145.

to 1200 meters. At no place did it show any rising summit. At no place either could one see any spot indicating the soil, and one might have thought that we had arrived before an ice-barrier still bigger than all those we had already met, if we could have been able to admit that ice-barriers ever could reach such a prodigious height. Its shore showed everywhere a vertical cliff of ice, similar to those we had observed in the floating islands we had been sailing past. This aspect of the coast was so exactly alike to the one which these floating bergs had shown us, that we did not retain the least doubt as to the formation of these latter. Moreover, on several points of the shore, we could see besides a good number of floating islands, which seemed barely separated from the land where they had formed and to be awaiting only the influence of the winds and of the currents to go out to sea. The elevated parts of the land showed everywhere an uniform tint; they ended at the sea by a gently inclined slope; thanks to this arrangement we could see a pretty considerable stretch of country. At several points, we noticed that the snows which covered the soil showed a broken and irregular surface. One could perceive regular waves, like those which the winds dig in sand deserts. It was especially in the least protected portions that these accidents appeared strongest. At other spots, this crust of ice seemed also traversed by ravines or cut

out by the waters. The sun shone in all its splendor and added greatly to the already so imposing aspect of this mass of ice. With our glasses we examined at every instant this mysterious land, whose existence it seemed could no longer be contested, but which had not offered to us as yet any absolutely certain proof of its existence."²⁰¹

Suddenly, however, some black spots were seen by Monsieur Duroch in the bay, and these turned out to be several small islands. Boats were sent from both *corvettes*, and some members of the expedition landed on one of the islands, on which they ran up the *tricolore* flag, and of which they took possession, as well as of the adjoining coast, in the name of France. The ceremony was concluded by drinking a bottle of Bordeaux wine. The little island was a bare rock and did not offer the slightest trace of lichens. The animal kingdom was represented only by penguins, and not a single shell was found. "Up²⁰² till then and during the whole time when there might have been doubts, I had not been

²⁰¹ Sir Clements R. Markham, in the *Encyclopædia Britannica*, ninth edition, American reprint, 1885, article "Polar Regions," says: "In 1839 the French expedition under Dumont d'Urville proceeded south from Tasmania and discovered two small islands on the Antarctic Circle named 'Terre Adélie' and 'Côte Clarie.'" It would be interesting to know on what authority Sir C. R. Markham bases his statement that Adélie Land and Côte Clarie are small islands.

²⁰² *Voyage au Pôle Sud*, etc., Tome Huitième, page 154.

willing to give a name to this discovery, but on the return of our boats I christened it 'Adélie Land.' The most prominent cape which we had seen during the morning, at the time we were trying to get nearer to the land, received the name of *Cap de la Découverte*. The point near which the boats landed, and where they were able to collect geological specimens, was called *Pointe Géologie*."

A tremendous storm arose shortly afterwards, and the ships were in danger, but succeeded in reaching open water. After the storm had ceased, they returned again south, but further west, and on the 29th, nearly off Cape Carr, met the U. S. S. "Porpoise," Commander Ringgold, but owing to a misunderstanding, they did not communicate. On the 30th, the French ships sailed for a distance of twenty or twenty-five leagues, along a wall of ice which was from thirty to forty-five meters high. This ice bluff was too elevated to permit the explorers to distinguish the details of the interior: "Thus,²⁰³ for more than twelve hours, we had followed this wall of ice which was perfectly vertical on its sides and horizontal on its top. Not an irregularity, not the slightest prominence broke this uniformity during the twenty leagues which were sailed over during the day. As for the nature of this enormous wall, as about the appearance of Adélie Land, opinions were again various ;

²⁰³ *Voyage au Pôle Sud*, etc., Tome Huitième, pages 175-177.

some held that it was a compact mass of ice independent of any land, others, and I share this opinion, contended that this formidable belt was at least an envelope, a crust, to a solid base, either of earth, or rocks, or even of high placed shallows spread out around a great land. In this, I always base myself on the principle that no ice of great size can form in the open sea, and that it always needs a solid supporting position to enable it to be fixed in a definite spot. However this may be, at ten o'clock in the evening, I started to the southwest, after having christened the ice barrier we had just examined, *Côte Clarie*." D'Urville stood north from here, and on February 17th, reached once more Hobart Town.

D'Urville's cruise is important. His narrative is so lucid that it is unnecessary to comment at length on it. It may be well, however, to call attention to the fact that both Wilkes and D'Urville saw this part of Wilkes Land, and that the narratives and the charts of the two explorers tally in all respects. Wilkes, however, saw even more than did D'Urville, for Wilkes, as his chart shows, hugged and sighted the coast between Piner Bay and Cape Carr. Wilkes also sighted the snowy heights of the mainland back of the ice cliffs of *Côte Clarie*, whilst D'Urville saw only the ice cliffs. It was these snowy heights which Wilkes called Cape Carr, and the ice cliffs which D'Urville called *Côte Clarie*. I lay stress on this point, because all the maps I have seen have

“Côte Clarie” on the land and “Cape Carr” on the ocean (when they mark them at all), and the reverse should be the case.

D'Urville does not seem to give any reasons for making this southern cruise, but—especially when we think of the crazy old tubs he commanded—he must be credited as having carried out a daring and successful journey.

Lieutenant Charles Wilkes, U. S. N.,²⁰¹ commanding the “United States Exploring Expedition”²⁰⁵ on

²⁰⁴ Charles Wilkes, of English parentage, was born in the City of New York on the 3d of April, 1798. He was appointed Midshipman in the United States Navy in 1818, and became Lieutenant in 1826. In 1838, he was appointed to the command of the U. S. Exploring Expedition, with the acting rank of Commander. After his return to New York on June 10th, 1842, he published his account of the exploration, and received the gold medal of the Royal Geographical Society of London. On November 8th, 1861, while in command of the “San Jacinto,” he intercepted the English mail steamer “Trent” and took off the Confederate commissioners, Mason and Slidell. For this, Congress passed a resolution of thanks, and the Secretary of the Navy sent Wilkes an emphatic commendation. In 1862, Wilkes commanded the James River flotilla, shelled City Point, Virginia, and on July 16th, was appointed Commodore. Then he commanded the West Indian Flying Squadron. He was retired for age in 1864, and appointed Rear Admiral in 1866. He died at his home in Washington in February 1877.

²⁰⁵ Wilkes, Charles, U. S. N., Commander of the Expedition: *Narrative of the United States Exploring Expedition*, during the years 1838, 1839, 1840, 1841, 1842; Philadelphia, Lea & Blanchard, 1845.

a voyage around the world,²⁰⁶ sailed on February 25th, 1839, from Orange Harbor, Tierra del Fuego.²⁰⁷ He was on the gun-brig "Porpoise," with the pilot boat "Sea-Gull," 110 tons, commanded by Lieutenant Johnson, as tender. On March 1st, they sighted Ridley Island in the South Shetlands. On the 2d they made

"Synopsis of the cruise of the U. S. Exploring Expedition during the years 1838, '39, '40, '41, & '42, delivered before the National Institute, by its commander, Charles Wilkes, Esq., on the twentieth of June 1842": Washington, Peter Force, 1842: (Harvard Univ. Lib.; British Museum).

Defence: The following defence of Lieut. Charles Wilkes to the charges on which he has been tried is respectfully submitted to the Court: Signed Charles Wilkes, Lt. U. S. N.: 56 pages: (British Museum; Harvard Univ. Lib.). This paper was published, probably, at Washington in 1842.

Wilkes, Charles: "Antarctic Exploration; letter to the editor of the *Union* (Dated) Washington, Aug. 12, 1847," (Wash. 8°, 1847, 7 pages). This paper was catalogued in the Harvard University Library, but it has been lost or mislaid. It is, I believe, a reply to the animadversions of Sir J. C. Ross.

Colvocoresses, Lieut. Geo. M. [Musalas], U. S. Navy: *Four Years in a Government Exploring Expedition*, New York, Cornish, Lamport & Co., 1852: (Lib. Co. Philadelphia).

²⁰⁶ Miss Carrell (*Harper's New Monthly Magazine*, Vol. XLIV., 1871, 1872; pages 60-64:—Carrell, Miss A. E.: "The First American Exploring Expedition,") claims that Mr. J. N. Reynolds was the originator of the expedition.

Dr. Callahan (*Johns Hopkins University Studies*, etc., Baltimore, March, 1901:—Callahan, James Morton, Ph. D.: "American Relations in the Pacific and the Far East," Chapter V., "The United States Exploring Expedition") tells a good deal of the preliminaries which led to the sending of the expedition.

²⁰⁷ *Narrative U. S. E. E.*, Vol. I., pages 133-145.

O'Brien, Aspland, and Bridgeman Islands. On the 3d they sighted Mount Hope, which Wilkes locates as the eastern extremity of Palmer Land, in $63^{\circ} 25'$ south latitude, $57^{\circ} 55'$ west longitude. They also discovered three small islets, which Wilkes christened the Adventure Islets. There were many icebergs floating about and too much ice along the coast to attempt landing. The "Sea-Gull" returned north on March 5th. On the 7th the "Porpoise" was nearly wrecked on some high land, which proved to be Elephant Island. This was of volcanic appearance and its valleys were filled with ice and snow.

On February 25th, also, two other ships of the "United States Exploring Expedition" sailed from Orange Harbor.²⁰⁸ These were the "Peacock," Captain Hudson, and the "Flying Fish," Lieutenant William M. Walker.²⁰⁹ On March 11th they saw the first iceberg. On the 13th their position was in $64^{\circ} 27'$ south latitude, 84° west longitude. On the 14th Captain Hudson remarked a great and striking change in the weather, as since 62° south latitude it had become much more settled and free from the sudden squalls and constant gales they had experienced after leaving Cape Horn.

²⁰⁸ *Narrative U. S. E. E.*, Vol. I., pages 149-161 ; 405-408 ; 408-414.

²⁰⁹ Palmer, J. C., U. S. N.: *Thulia, a tale of the Antarctic*, New York, Samuel Colman, MDCCCXLIII: (Lenox Lib. New York City.) This is a short poem about the cruise of the "Flying Fish": the appendix, which is in prose, says she reached $70^{\circ} 14'$ south latitude.

On the 17th and 18th, however, they had another heavy gale. On the 20th the "Flying Fish" was in $67^{\circ} 30'$ south latitude, 105° west longitude. A cast of the lead showed no bottom in one hundred fathoms. The water was much discolored, and Lieutenant Walker afterwards observed this same discoloration of the water in the vicinity of extensive masses of ice: he thought it might possibly be produced by refraction. The "Flying Fish" at this time was in a fog. This lifted and disclosed a wall of ice from four to six meters high, extending east and west as far as the eye could reach, and spreading out into a vast and seemingly boundless field to the south. Some floating ice had the appearance of being but lately detached from the land. On the 20th, the "Peacock" was in 68° south latitude, 90° west longitude, and obtained a sight of an icy barrier of field-ice and icebergs. On the 21st, the "Flying Fish" was in $68^{\circ} 41'$ south latitude, $103^{\circ} 34'$ west longitude, running among ice-islands. On the 23d, the "Flying Fish" reached 70° south latitude, $100^{\circ} 16'$ west longitude: here they observed an appearance of land,²¹⁰ and saw large masses of ice and numerous icebergs. They then turned northward and on the 25th fell in with the "Peacock" in 68° south latitude, $97^{\circ} 58'$ west longitude. The two ships then returned together to Orange Harbor.

²¹⁰ The course of the "Belgica" shows that probably there is no land at this spot. See *post*, page 206.

In 1839 and 1840, Lieutenant Wilkes made a second cruise to the Antarctic, in accordance with his Instructions, from the Hon. J. K. Paulding, Secretary of the Navy, which were as follows:²¹¹

“NAVY DEPARTMENT, August 11th, 1838.

* * * * *

“These objects will, it is presumed, occupy you until the latter end of October; and when attained as far as may be possible, you will proceed to the port of Sydney, where adequate supplies may be obtained. From thence you will make a second attempt to penetrate within the Antarctic region, south of Van Diemen’s Land, and as far west as longitude 45° E., or to Enderby’s Land, making your rendezvous on your return at Kerguelen’s Land, or the Isle of Desolation, as it is now usually denominated, and where you will probably arrive by the latter end of March, 1840.”

Wilkes’ squadron was composed of the sloop of war “Vincennes,” 780 tons, under his own command; the sloop of war “Peacock,” 650 tons, Commander William L. Hudson; the gun brig “Porpoise,” 230 tons, Lieutenant Commander Cadwalader Ringgold; and the pilot boat “Flying Fish,” 96 tons, Lieutenant R. F. Pinkney. None of these vessels was suitable for ice work, nor was the expedition properly equipped for²¹² “it may be borne in mind that our vessels had no

²¹¹ *Narrative U. S. E. E.*, Vol. I., page XXVII.

²¹² Wilkes: *Narrative U. S. E. E.*, Vol. II., page 298.

planking, extra fastening, or other preparations for these icy regions, beyond those of the vessels of war in our service." The people at Sydney²¹³ "inquired, whether we had compartments in our ships to prevent us from sinking? How we intended to keep ourselves warm? What kind of antiscorbutic we were to use? and where were our great ice saws? To all of these questions I was obliged to answer, to their great apparent surprise, that we had none, and to agree with them that we were unwise to attempt such service in ordinary cruising vessels; but we had been ordered to go, and that was enough, and go we should. * * *

The tender Flying Fish excited their astonishment more than the ships, from her smallness and peculiar rig; and, altogether, as a gentleman told me, most of our visitors considered us doomed to be frozen to death. I did not anticipate such a fate, although I confess I felt the chances were much against us, in case we were compelled to winter within the Antarctic. From every calculation we could not stow quite twelve months' provision, even upon short allowance; our fuel was inadequate to last us more than seven months, and the means of protecting ourselves in the ships for winter quarters, were anything but sufficient." The "Peacock"²¹⁴ was in especially bad condition, for her sheer-streak, to which the channels

²¹³ Wilkes: *Narrative U. S. E. E.*, Vol. II., page 275.

²¹⁴ Letters of Mr. Dibble, carpenter, and Captain Hudson: *Narrative U. S. E. E.*, Vol. II., page 449.

were bolted and ports hung, was perfectly decayed, fore and aft, and all the stanchions of the upper deck bulwarks were either rotten or in an advanced state of decay. It was, therefore, with unsuitable ships, improperly equipped, that Wilkes started on the cruise which resulted in the great discovery, that in the Antarctic there is a mass of land probably continental in its dimensions.

The expedition started from Sydney on December 26th, 1839. The tender "Flying Fish" parted company with it on January 1st, 1840, and cruised by itself.²¹⁵ On the 21st it made an icy barrier in $65^{\circ} 20'$ south latitude, $159^{\circ} 36'$ east longitude. On the 23d, in $65^{\circ} 58'$ south latitude, $157^{\circ} 49'$ east longitude, they discovered several dark spots, which they made out to be rocks. After this they cruised along the ice barrier until February 5th, when they were in 66° south latitude, 143° east longitude, and were forced to return north on account of sickness.

After parting company with the "Flying Fish," the other ships continued their course south, and on January 7th, 1840, were in $54^{\circ} 20'$ south latitude, and $160^{\circ} 47'$ east longitude, not far from Macquarie Island. On the 10th they encountered the first iceberg. On the 11th, at 10.30 P. M., in $60^{\circ} 11'$ south latitude, $164^{\circ} 36'$ east longitude, they were stopped by a compact barrier of ice, enclosing large square icebergs. The water changed to an olive green color.

²¹⁵ *Narrative U. S. E. E.*, Vol. II., pages 354-359.

On the 13th, in $65^{\circ} 8'$ south latitude, 163° east longitude, they came up to an icy barrier. "Very lofty ridges of ice,²¹⁶ and the loom usual over high land, were visible along the southern horizon, over the barrier. * * * From appearances to the southward, with the numerous *Phocae proboscidae*, I was strongly impressed with the belief of the close approach of land."²¹⁷

"On the 16th²¹⁸ the three vessels were in longitude $157^{\circ} 46'$ E., and all within a short distance of each other. * * * On this day (16th January) appearances believed at the time to be land were visible from all the vessels, and the comparison of the three observations, when taken in connection with the more positive proofs of its existence afterwards obtained, has left no doubt that the appearance was not deceptive. From this day therefore, we date the discovery which is claimed for the squadron. * * * On board the Peacock, it appears

²¹⁶ Ringgold's Report: *Narrative U. S. E. E.*, Vol. II., page 469.

²¹⁷ The Balleny Islands are about one and a half degrees of latitude south of the spot where the *Porpoise* was on January 13th. It is therefore practically certain that "the loom usual over high land" was caused by them. Mr. Borchgrevink (*Geographical Journal*, Vol. XVI., October, 1900, page 381) also appears to be of this opinion, for he says: "I had, however, purposely taken that course in order to satisfy myself respecting the land reported by Captain Wilkes, and which, it seems clear to me, was, in reality, Balleny."

²¹⁸ Wilkes: *Narrative U. S. E. E.*, Vol. II., pages 292, 293.

that Passed Midshipmen Eld and Reynolds both saw the land from the masthead, and reported it to Captain Hudson: he was well satisfied on examination that the appearance was totally distinct from that of ice islands, and a majority of the officers and men were also satisfied that if land could exist, that was it. * * * In Passed Midshipman Eld's journal, he asserts that he had been several times to the masthead during the day, to view the barrier: that it was not only a barrier of ice, but one of terra firma. Passed Midshipman Reynolds and himself exclaimed, with one accord, that it was land. Not trusting to the naked eye, they descended for spy-glasses, which confirmed, beyond a doubt, their first impression. The mountains could be distinctly seen, over the field ice and bergs, stretching to the southwest as far as anything could be discerned. Two peaks, in particular, were very distinct (which I have named after those two officers,) rising in a conical form; and others, the lower parts of which were quite as distinct, but whose summits were lost in light fleecy clouds. Few clouds were to be seen in any other direction, for the weather was remarkably clear. The sun shone brightly on ridge after ridge, whose sides were partially bare; these connected the eminences I have just spoken of, which must be from one to two thousand feet high. Mr. Eld further states, that on reporting the discovery to Captain Hudson, the latter replied that there was

no doubt of it, and that he believed that most of the icebergs then in sight were aground. At this time they were close in with the barrier, and could approach no nearer. On this day, the Peacock got a cast of the deep-sea lead, with Six's thermometer attached, to the depth of eight hundred and fifty fathoms, only a short distance from the barrier; the temperature of the surface was 31° , and at the depth sounded, $31\frac{1}{2}^{\circ}$, current one fourth of a mile, north by east."

"On the evening of the 16th,²¹⁹ strong appearances of land again arose, in corroboration of which I insert an extract from my journal, as well as the remarks from the log book. * * * Extract from Journal. 'At 6 h. 30 m. P. M. I went aloft to take a look, the weather being clear, horizon good and clouds lofty. I heard the noise of a penguin; soon after, one was seen very near the brig, with a large seal to windward. After reaching masthead, I saw over the field of ice, an object, large, dark and rounding, resembling a mountain in the distance. The icebergs all were bright and brilliant, and in great contrast. * * * I watched for an hour to see if the sun in his decline would change the colour of the object by a difference of rays: it remained the same, with a white cloud above, similar to those generally hovering over high land; at sunset it remained the same. I took the bearing accurately, intending to examine it closely as

²¹⁹ Ringgold's Report: *Narrative U. S. E. E.*, Vol. II., pages 469, 470.

soon as I got a breeze. I am strongly of the opinion it is an island, surrounded by immense fields of ice now in sight.' * * * Extract from Log. '7 P. M. discovered what was supposed to be an island, bearing south-by-east,—a great deal of field ice in sight. (Signed) J. H. North.' * * * 17th, the indications were again noticed, corroborating those of the day preceding."

"On the morning of the 19th,²²⁰ we found ourselves in a deep bay, and discovered the Peacock standing to the southwest. Until eight o'clock, A. M. we had a moderate breeze. The water was of a darker olive-green, and had a muddy appearance. Land was now certainly visible from the Vincennes, both to the south-southeast and southwest, in the former direction most distinctly. Both appeared high. It was between eight and nine in the morning when I was fully satisfied that it was certainly land, and my own opinion was confirmed by that of some of the oldest and most experienced seamen on board. The officer of the morning watch, Lieutenant Alden, sent twice and called my attention to it. We were at this time in longitude 154° 30' E., latitude 66° 20' S.; the day was fine, and at times quite clear, with light winds. After divine service, I still saw the outline of the land, unchanged in form but not so distinct as in the morning. By noon, I found we were sagging on to the barrier; the boats were lowered in consequence,

²²⁰ Wilkes : *Narrative U. S. E. E.*, Vol. II., pages 295, 296.

and the ship towed off. The report from aloft was, 'A continued barrier of ice around the bay, and no opening to be seen, having the western point of it bearing to the northward of west of us.' I stood to the westward to pass around it, fully assured that the Peacock would explore all the outline of the bay."

"On Sunday, January 19th,²²¹ while standing into a bay of ice, in latitude 66° 31' S., and longitude 153° 40' E., we made (what we believed to be) land to the southward and westward.²²² * * * It was

²²¹ Hudson's Report: *Narrative U. S. E. E.*, Vol. II., page 465.

²²² The proceedings before the Court Martial held after the return of the Exploring Expedition also show plainly that the officers thought they saw land on January 19, and that Ringgold must have, and thought he must have, sighted the high mountain of the Balleny Isles on January 13. Some of the testimony of the officers was published in a short paper which was probably printed at Washington in 1842: *Defence: The following defence of Lieut. Charles Wilkes to the charges on which he has been tried is respectfully submitted to the Court*: Signed Charles Wilkes, Lt. U. S. N., 56 pages: (British Museum; Harvard Univ. Lib.)

Page 26. "The sixth and most important charge is that of scandalous conduct tending to the destruction of good morals."

"The first specification charges me with uttering a deliberate and wilful falsehood, in the following words, to wit: 'On the morning of the 19th of January, we saw land to the southward and eastward, with many indications of being in its vicinity, such as penguins, seal, and the discolouration of the water, but the impenetrable barriers of ice prevented our nearer approach to it;' the said Lieut. Charles Wilkes well knowing that land to the southward and eastward was not seen on said morning as asserted by him." * * *

seen towering above and beyond some large icebergs, that were from one hundred to one hundred

Pages 27-28: "Lieut. Ringgold testifies as follows:

"Q. Did you report to Lieut. Wilkes that you had seen land on the 26th of January.

"A. No I did not.

"Q. Did you not see the land prior to that date?

"A. To the best of my belief, I saw it on the 13th January, though I did not make a positive report. On that occasion I saw about 100 seal, and captured two as specimens; and from the discolouration of the water, I thought the indications were very strong. I think I sounded with 287 fathoms, but did not succeed in getting ground. It was nearer Bellamy's position than we ever were afterwards: but we were not aware of Bellamy's discovery at the time." * * *

"Very lofty ridges of ice, and the loom usual over the high land was visible along the southern horizon over the barrier.'

"I made no positive report, nor mentioned it in the log, because I was not positive that it was land, though I have very little doubt about it. I think I mentioned it when I saw Lieut. Wilkes at New Zealand."

Page 30: "Again—Lieut. Alden testifies as follows: 'That at Sydney Lieut. Wilkes came on board of the ship, and I remarked the French were ahead of us—that Wilkes remarked—Oh no, don't you remember reporting to me appearances of land on the nineteenth. I told him I could not call it to my mind then, and would refer to the log, which convinced me at once, from the fact, that I had the morning watch, it being Sunday, and other circumstances that I had called his attention to something like land.' He says afterwards, I sent for Lieut. Wilkes—that we were in close proximity to ice, and when he was on deck I said—there is something there—pointing to the southward—that looks like land."

"The testimony of Gunner Williamson is as follows:

"Q. Were you Gunner of the Vincennes on her last cruise; if yea, state whether you saw land on the 19th January, 1840, and what you said to Lieut. Wilkes on the subject.

and fifty feet in height. We endeavored to work up for this land, which presented the appearance of an immense mass of snow, apparently forming a vast amphitheatre, with two distinct ridges or elevations throughout its extent. After working up until

“A. I was acting Gunner for the last three years; on the morning of the 19th, I was standing on the starboard gangway, Capt. Wilkes was on the deck at the time—he came and asked me what I thought of the appearance of land. My answer was—‘If it is not land, I have never seen land.’ It was in the morning between 9 and 10 I think.”

“Lieut. Davis testified that on the nineteenth, he saw strong indications of land, and entered it in the log of the Peacock. He says he is still under the impression that it was land, and that impression was confirmed by getting soundings on the twenty-third, at 380 fathoms.”

“This witness proves the relative position of the Peacock on the twenty-third to be within fifty miles of that of the Vincennes, on the nineteenth.

“He says the difference was two degrees in longitude; there are about twenty miles to a degree in that latitude. The Peacock on the nineteenth was in longitude $153^{\circ} 40'$ East: on the twenty-third, $151^{\circ} 41'$ East: the latitude on the nineteenth was $66^{\circ} 22'$ and on the twenty-third $66^{\circ} 30'$. The latitude is eight miles difference to the south, and about 50 miles difference along the land.”

Page 31. “Passed Mid. Eld testifies, that between ten and eleven on the sixteenth, he, with Lieut. Reynolds, was on the main-topmast cross-trees, and both simultaneously exclaimed, ‘there is the land.’ He describes it with accuracy; and adds, that looking at it for some time they sent down for a glass, and examined it very closely, and came to the conclusion that it could be nothing else but *terra firma*. He says he saw land also on the nineteenth from the masthead. He also saw it on the twenty-third and twenty-fourth; and says soundings were got on the twenty-third.

midnight through detached portions of ice, we reached the barrier at the head of the bay, and were compelled to give up any further attempt to near it, (what we believed to be land,) and passed out of the bay again, which was some twenty miles in extent, through drift-ice, into a more open space for pursuing our course to the southward and westward along the barrier."

"On the 22nd,²²³ 4 A. M., appearances of land again to the southward and eastward, at the time passing an iceberg with dark veins and dusty appearances, exciting confident hopes of soon making positive discoveries."

"He says the land he saw on the nineteenth was distant about forty miles."

Lieutenant Colvocoresses of the "Vincennes" in his book (*Four Years*, etc.) does not mention sighting land until January 19th, when he says: "It is believed by many of us that we are in the vicinity of land * * * For the past three hours appearances have been visible both to the southeast and southwest which very much resemble mountains. (Note. The same appearances were observed by the 'Peacock' and the 'Porpoise,' and it is now fully established that they were high land, and formed a part of the Antarctic Continent discovered by the Expedition)." He mentions "appearances of land" on January 23d. He speaks on January 30th, of the land itself; on February 7th, of Cape Carr; on February 12th, of a range of mountains covered with snow in $112^{\circ} 17'$ east longitude; and on February 14th, of land in $105^{\circ} 30'$ east longitude, at which place stones off an iceberg "were brought on board, and they very soon disappeared, for every one was anxious to possess themselves of a piece of the *new continent*."

²²³ Ringgold's Report: *Narrative U. S. E. E.*, vol. II., page 470.

“On the 23rd²²⁴ of January we made, beyond the barrier, which was thickly studded with bergs and islands of ice, (what we believed to be,) high land, at least so far as terra firma can be distinguished where everything is covered with snow, and worked into a bay for a nearer and more minute examination. The sea water had been discoloured for some days, but no bottom obtained by soundings; in the bay, however, it changed to a dark dull green, and gave every indication that we were on soundings, and not far from land. * * * The result confirmed the appearances: we obtained bottom in three hundred and twenty fathoms, of slate coloured mud, and the lead brought up with it a piece of stone, about an inch in length, of the same colour, while the lower part of the lead showed a fresh and deep indentation, as though it had struck on a rock. Dip observations were made on the ice with Robinson’s and Lloyd’s needles; the former gave 86.10° , the latter 86.23° . * * * While ascertaining the dip, a large king-penguin was captured on the ice, and brought to the ship; to add to our collections, in his stomach were found thirty-two pebbles of various sizes, which appeared to have been very recently obtained, and afforded additional evidence of our immediate proximity to land.

A tremendous storm now arose, in which the “Peacock” was so severely damaged by contact with

²²⁴ Hudson’s Report: *Narrative U. S. E. E.*, vol. II., page 465.

icebergs, that it was indispensable for her to return north, which was done. It was found that "the ice had chafed the stem to within one inch and a half of the wood-ends of the planking."²²⁵

The "Vincennes" and "Porpoise" continued sailing along the coast. An ice bound bay was explored on January 23d, and called Disappointment Bay. It was in $67^{\circ} 4' 30''$ south latitude, and $147^{\circ} 30'$ east longitude. On the 28th there was another terrible gale, in which the ships escaped destruction from contact with icebergs by sheer good luck.

On January 30th, "we approached"²²⁶ within a half mile of the dark, volcanic rocks, which appeared on both sides of us, and saw the land gradually rising beyond the ice to the height of three thousand feet, and entirely covered with snow. It could be distinctly seen extending to the east and west of our position fully sixty miles. I make this bay in longitude $140^{\circ} 02' 30''$ E., latitude $66^{\circ} 45'$ S., and now that all were convinced of its existence, I gave the land the name of the Antarctic Continent. Some of the officers pointed out the appearance of smoke, as if from a volcano, but I was of the opinion that this was nothing but the snow-drift, caused by the heavy squalls. There was too much wind at this time to tack, I therefore had recourse to luffing the vessel up in the wind, and wore her short round on her heel.

²²⁵ Hudson's Letter : *Narrative U. S. E. E.*, Vol. II., page 468.

²²⁶ Wilkes : *Narrative U. S. E. E.*, Vol. II., page 316.

At the same time we sounded, and found a hard bottom at the depth of no more than thirty fathoms. I made a rough sketch of this bay, which I have called Piner's Bay, after the signal quarter-master of that name."

At this time there was much sickness on the ship, and Wilkes sent official letters to the officers and surgeons asking for their opinion about what course should be taken. Their answers, dated January 31st, are interesting. "We have been almost surrounded²²⁷ with drift-ice and ice-islands for the last twenty-three days, and coasting along the barrier of field-ice, which has rendered it impossible to penetrate further south in this vicinity; and, although gratifying it would be to land upon the Antarctic Continent, I am not aware that any advantages to be derived from it would be commensurate for the dangers it would be necessary to incur; and if the discovery of new land in these regions is important, I consider it equally so that every precaution be taken to communicate the same to others." * * * "We would state,²²⁸ that, in our opinion, it would be as well to hold on until

²²⁷ Purser R. R. Waldron, of the "Vincennes": *Narrative U. S. E. E.*, Vol. II., page 462. This letter is important, because it proves that on January 31st, 1840, the name "Antarctic Continent" had been definitely given; and also because this is probably the first time the name was written officially (unless in the log).

²²⁸ First Lieutenant Overton Carr; Lieutenants A. Ludlow Case and Joseph A. Underwood; Acting Master Edward H. deHaven, and Samuel R. Knox, of the "Vincennes": *Narrative U. S. E. E.*, Vol. II., page 461.

to-morrow at meridian, in order, should the weather then prove favorable, to attempt making the recently-discovered land at another point;" * * * "I am of opinion,²²⁹ with due regard to the report of the medical officers, which you have submitted to our perusal, that it is very desirable to ascertain the extent of the recently-discovered land, by another attempt to the westward;" * * * "I think²³⁰ it would be advisable to remain in this vicinity at least two days longer, and if possible, get further information respecting the recently-discovered land."

"The 2d of February²³¹ found us about sixty miles to the westward of Piner's Bay, steering to the southward, and as usual among ice-islands, with the land in sight. The land had the same lofty appearance as before. * * * Our longitude now was 137° 02' E., latitude 66° 12' S.," * * * "On the 7th²³² we had much better weather, and continued all day running along the perpendicular icy barrier, about one hundred and fifty feet in height. Beyond it the outline of the high land could be well distinguished. * * * I place this point, which I have named Cape Carr, after the first lieutenant of the Vincennes, in longitude 131°

²²⁹ Lieutenant James Alden : *Narrative U. S. E. E.*, Vol. II., page 462.

²³⁰ Chaplain Jared Elliott : *Narrative U. S. E. E.*, Vol. II., page 463.

²³¹ Wilkes : *Narrative U. S. E. E.*, Vol. II., page 320.

²³² Wilkes : *Narrative U. S. E. E.*, Vol. II., page 321.

40' E., and latitude 64° 49' S." "On the 10th²³
 * * * running close along the barrier, which contin-
 ued of the same character, although more broken than
 yesterday, we saw an appearance of land, although
 indistinctly, to the southward * * * longitude
 122° 35' E., latitude 65° 27' S. * * * During the 12th
 we had pleasant weather and at 2 A. M. filled away.
 At 8 A. M. land was reported to the southwest.
 * * * Land was now distinctly seen, from eighteen
 to twenty miles distant, bearing from south-southeast
 to southwest—a lofty mountain range, covered with
 snow, though showing many ridges and indentations
 * * * We had decreased our longitude to 112°
 16' 12" E., while our latitude was 64° 57' S. This
 puts the land in about 65° 20' S., and its trending
 nearly east and west."

"I gained the meridian of 105° E.,²³⁴ on the 12th
 of February, latitude 64° 54' S.; the weather was
 at intervals misty, affording little opportunity for
 observation; many strong indications of land pre-
 sented themselves. * * * As I advanced west-
 ward, the marks of the approach to land were be-
 coming too plain to admit a doubt. The constant
 and increasing noise of penguins and seals, the dark
 and discoloured aspect of the ocean, with frequent
 huge masses of black frozen earth identified there-

²³³ Wilkes: *Narrative U. S. E. E.*, Vol. II., pages 323, 324.

²³⁴ Ringgold's Report: *Narrative U. S. E. E.*, Vol. II., pages
 471, 472.

with, strongly impressed me with the belief that a positive result would arise in the event of a possibility to advance a few miles further south. * * * On the afternoon of the 13th, I landed and extracted from an immense mass of black earth identified with the barrier, some hundreds of yards back from the margin, specimens of rock corresponding to those previously obtained." * * *

"13th²³⁵ * * * In the afternoon we had the land ahead, and stood in for it with a light breeze until 6½ P. M. when I judged it to be ten or twelve miles distant. It was very distinct, and extended from west-southwest to south-southeast. We were now in longitude 106° 40' E., and latitude 65° 57' S. * * * 14th.²³⁶ At daylight we again made sail for the land, beating in for it until 11 A. M. when we found any further progress quite impossible. I then judged that it was seven or eight miles distant. The day was remarkably clear, and the land very distinct. By measurement, we made the extent of coast of the Antarctic Continent, which was then in sight, seventy-five miles, and by approximate measurement, three thousand feet high. It was entirely covered with snow. Longitude at noon, 106° 18' 42" E., latitude 65° 59' 40" S. * * * I determined to land on the largest ice-island that seemed accessible. * * * We found embedded

²³⁵ Wilkes : *Narrative U. S. E. E.*, Vol. II., page 324.

²³⁶ Wilkes : *Narrative U. S. E. E.*, Vol. II., page 325.

in it, in places, boulders, stones, gravel, sand and mud or clay. The larger specimens were of red sandstone and basalt. No signs of stratification were to be seen in it, but it was in places formed of icy conglomerate (if I may use the expression), composed of large pieces of rocks, as it were frozen together, and the ice was extremely hard and flint-like. The largest boulder embedded in it was about five or six feet in diameter, but being situated under the shelf of the iceberg, we were not able to get at it. Many specimens were obtained, and it was amusing to see the eagerness and desire of all hands to possess themselves of a piece of the Antarctic Continent. These pieces were in great demand during the remainder of the cruise. * * * This island had been undoubtedly partly turned over. * * * On the 17th²³⁷ about 10 A. M., we discovered the barrier extending in a line ahead, and running north and south as far as the eye could reach. Appearances of land²³⁸ were also seen to the southwest, and its trending seemed to be to the northward. We were thus cut off from any further progress to the westward, and obliged to retrace our steps. * * * We were now in longitude 97° 37' E., and latitude 64° 01' S."

²³⁷ Wilkes: *Narrative U. S. E. E.*, Vol. II., page 327.

²³⁸ Termination Land, whose existence is still uncertain. Dr. Fricker (*The Antarctic Regions*, page 221) suggests that Wilkes may have seen land by refraction.

The expedition now turned northward and the "Vincennes" proceeded first to Hobart Town, then to Sydney, which it reached on March 11th. Lieutenant Wilkes immediately announced the discovery of a South Polar Continent to the Secretary of the Navy in the following letter, dated at Sydney, New South Wales, March 11th, 1840:—

"It affords me much gratification to report that we have discovered a large body of land within the Antarctic Circle, which I have named the Antarctic Continent, and refer you to the report of our cruise and accompanying charts, inclosed herewith, for full information relative thereto."²³⁹

As far as I know, this is the first definite announcement of a mass of land, probably continental in size, in the antarctic region. Five or six explorers *may* have sighted the Continent of Antarctica prior to 1840, but none of them saw enough land to be able to assert that he had seen anything more than islands. The nearest approach to such a statement was the casual remark of Edmund Fanning about "Palmer's Continent." A strong proof that there was no knowledge of an Antarctic Continent, prior to 1840, is furnished by the charts published before that date. No land is charted by Wed-

²³⁹ Captain Chapman C. Todd, U. S. N., called my attention to this letter. It was first published in *Bulletin of the American Geographical Society*, Vol. XXXI., 1899, pages 123-149:— Littlehales, G. W.: "The navy as a motor in geographical and commercial progress."

dell, except south of South America, and on Biscoe's chart there is no land marked east of Enderby Land, up to the lands of West Antarctica. *It is, therefore, only the exact truth to assert that the honor of recognizing the existence of the Continent of Antarctica belongs to Charles Wilkes and to the United States Exploring Expedition.*²⁴⁰

Two days later, the first account of the discovery of a South Polar Continent ever printed, was published in *The Sydney Herald* of March 13th, 1840. I have not seen the original of this, but there is a reprint of it in the *Nautical Magazine* for 1840.²⁴¹ The article is as follows:—

“An interesting geographical discovery has been made in the Southern Antarctic Ocean, of a Continent with a coast of about 1,700 miles from east to west, highly useful for seal and whale fishery. The most

²⁴⁰ Dr. Oscar Peschel (*Geschichte der Erdkunde*, 1865, pages 451-453) a German geographer, was hostile to Wilkes, basing his belief on Ross' theories. His opinion therefore is doubly valuable when he writes: “Despite this, Wilkes considered himself justified, in giving to his discoveries the name of ‘The Antarctic Continent’ and he is therefore responsible, for again having evoked the shade of a south polar land.” Dr. Hans Reiter (*Zeitschrift für wissenschaftliche Geographie*, Weimar, VI., 1888, pages 1-30), quotes these remarks of Peschel and continues: “Is the Antarctic continent, which Wilkes called up, really as much of a ghost as Peschel thought?”

²⁴¹ *The Nautical Magazine and Naval Chronicle for 1840*, London, Simpkin, Marshall & Co., Hall Court, page 592. Professor George Davidson, of San Francisco, called my attention to this important article.

singular coincidence is, that it was discovered by the French and Americans on the same day, January 19th, 1840, at a distance of 720 miles from each other.

“Amongst the arrivals to be found in our shipping list of this day, is that of the United States ship Vincennes under the command of Charles Wilkes, Esq. The Vincennes has been absent from this port almost eighty days, most of which time has been spent in southern exploration, and we are happy to have it in our power to announce, on the highest authority, that the researches of the exploring expedition after a southern continent have been completely successful. The land was first seen on the morning of the 19th of January, in latitude 64 deg. 20 min. south, longitude 154 deg. 18 min. east.

“The Peacock (which ship arrived in our harbor on the 22nd ult., much disabled from her contact with the ice,) we learn, obtained soundings in a high southern latitude, and established beyond doubt the existence of land in that direction. But the Vincennes more fortunate in escaping injury, completed the discovery, and run down the coast from 154 deg. 18 min. to 97 deg. 47 min. east longitude, about seventeen hundred miles, within a short distance of the land, often so near as to get soundings with a few fathoms of line, during which time she was constantly surrounded with ice-islands and bergs, and experiencing many heavy gales of wind, exposing her constantly to shipwreck. We also understand

that she has brought several specimens of rocks and earth procured from the land, some of them weighing upwards of one hundred pounds.

“It is questionable whether this discovery can be of any essential benefit to commerce; but it cannot be otherwise than highly gratifying to Captain Wilkes and the officers engaged with him in this most interesting expedition, to have brought to a successful termination the high trust committed to them by their country, and it is hoped that so noble a commencement in the cause of science and discovery, will induce the Government of the United States to follow up by other expeditions that which is now on the point of termination.

“We understand that the Vincennes will sail on Sunday or Monday next, for New Zealand (*sic*), where the Porpoise and Flying Fish will rejoin her, should they have been equally fortunate with their two consorts in escaping from the ice. The Peacock will follow as soon as her repairs are completed; whence they will all proceed in furtherance of the objects of the expedition.—*Sydney Herald, 13th March.*”

Another account of the discovery of the Antarctic Continent, was also published in London in 1840 in *The Asiatic Journal*.²¹² This says that Wilkes dis-

²¹² *The Asiatic Journal and Monthly Register for British and Foreign India, China and Australia*; Vol. XXXIII., New Series, Sept.–Dec., 1840; London, Wm. H. Allen, 1840, pages 31–37: “Discovery of the Antarctic Continent”: (Bib. Nat. Paris).

covered land on January 19, 1840, in $66^{\circ} 20'$ south latitude, $154^{\circ} 27'$ east longitude, and that the land was named "Antarctic Continent" before February 2d. The last words of the article are another uncontrovertible proof that the existence of a southern continent was fully recognized in England by English writers before the end of the year 1840: "Thus then, the problem of an Antarctic Continent has been so far satisfactorily solved, as that there can be no doubt of its existence. The coincidence of the two descriptions is a guarantee of the fidelity of both. Whether science, commerce or civilization be likely to reap any important fruits from the discovery, remains to be seen."

The cruise of Wilkes will remain among the remarkable voyages of all time. No finer achievement has been accomplished in the annals of the Arctic or of the Antarctic.²⁴³ With unsuitable, improperly equipped ships, amid icebergs, gales, snow storms and fogs, Wilkes followed an unknown coast line for over fifteen hundred miles, a distance exceeding in length the Ural Mountain Range. It is the long distance which Wilkes traversed which makes the results of his cruise so important; for

²⁴³The able and impartial Sir John Murray, for instance, (*The Geographical Journal*, London, 1894, Vol. III., pages 1-42:—"The Renewal of Antarctic Exploration") says: "When we remember that their ships were wholly unprotected for ice, the voyages of D'Urville and Wilkes to the Antarctic Circle south of Australia must be regarded as plucky in the extreme."

he did not merely sight the coast in one or two places, but he hugged it for such a distance as to make sure that the land was continental in dimensions. The expedition noticed appearances of land on January 13th; it sighted land almost surely on January 16th, from $157^{\circ} 46'$ east longitude and again more positively on January 19th, from $154^{\circ} 30'$ east longitude, $66^{\circ} 20'$ south latitude. The discovery, therefore, was made probably four days earlier than that of D'Urville. On January 30th, the size of the land was sufficiently ascertained to receive the name "Antarctic Continent," and this discovery of Wilkes' is the most important discovery yet made in the Antarctic.

It is scarcely probable, however, especially when the constant fogs and snow storms are taken into consideration, that the outline of the coast of Wilkes Land is accurate, sketched in as it was during a single reconnaissance; but that there is the shore of a continent between about 154° and 100° east longitude can scarcely be doubted by any unprejudiced person who reads the *Narrative*. The vast number of ice islands and tabular icebergs shows that there is some extensive nucleus which retains them in an uninterrupted line on nearly the same degree of latitude, and moreover these enormous bergs are not formed, according to most explorers, in the open sea. Along this extended coast neither any open strait nor northerly currents were observed, and the

absence of both are strong proof of a continental mass of land, rather than of an archipelago of islands.

It is in accordance with tradition, however, that Wilkes should be traduced for having discovered something.²⁴⁴ Marco Polo's account of the *Ovis Poli* was disbelieved for six hundred years. Columbus was put in chains. Amerigo Vespucci, who like Wilkes, first recognized the existence of a continent, has not, even yet, had his character restored to him. Baffin's Bay took many shapes during two centuries and was just disappearing altogether when Sir John Ross saved it. Abel Tasman was told that he had

²⁴⁴ Some of the officers of the United States Expedition—William M. Walker, Lieut.; Robert E. Johnson, Lieut.; James Alden, Lieut.; John B. Dale, Lieut.; Edwin J. DeHaven, Lieut.; A. S. Baldwin, Lieut.; George T. Sinclair, Lieut.; William Reynolds, Lieut.; Simon F. Blunt, Lieut.; William May, Lieut.; Joseph P. Sanford, Lieut.; George Colvocoresses, Lieut.; James Blair, Passed Midshipman—felt aggrieved about some of the statements published by Lieutenant Wilkes in his *Narrative*. In consequence they prepared a paper: *Memorial of Officers of The Exploring Expedition to the Congress of the United States*: Washington, January, 1847: (Geog. Soc. Philadelphia.) All the complaints made by these officers are purely *personal* ones, about matters or charges which they considered reflected on them personally. The only mention at all of the Antarctic Cruise is the following (page 12): “ ‘Vol. 2, page 359—Lieutenant Pinckney was enabled to come again on deck, who had scarcely been able to quit his berth since leaving Maquarie Island, from sickness.’ ” The following half page explains that this sentence is incorrect, and that the commander of the “Flying Fish” was on duty, with the exception of one or two days, during the whole of his cruise in the Antarctic.

not accomplished anything and that better men would be sent. Paul B. du Chaillu, the hunter of the gorilla and the discoverer of the pygmies, was advised by his publishers "to stick to it." Henry M. Stanley learnt that he had been rescued by Dr. Livingstone, who was "in clover," *et cetera*. Among antarctic voyagers also, Bouvet and Kerguelen were disbelieved in and sneered at, nevertheless their discoveries have stood the test of subsequent explorations, as will doubtless be the case with those of Wilkes, whenever a ship is sent to the coast of Wilkes Land. It is, therefore, nothing out of the general run that Wilkes should be disbelieved; but the fact that he has been so much attacked only proves that he did discover something of which the world was ignorant at the time.

Impartial geographers in due time recognized the importance of Wilkes' discovery, and in recognition of his work affixed the name of Wilkes Land to the portion of the Antarctic Continent along which he coasted. I do not know who suggested the name of Wilkes Land, nor on what map or atlas it first appeared but it is found as far back as 1866, in *Stichler's Atlas*, Justus Perthes, Gotha. It is found also in Bartholomew's *The Library Reference Atlas*, 1890; in the *Library Atlas of Modern Geography*, D. Appleton, New York, 1892; in Justus Perthes' *Taschen Atlas*, Gotha, 1893; in Sir John Murray's map, *Geographical Journal*, Vol. III., 1894; in Alex. Keith

Johnston's *The Royal Atlas*, 1894; in *The Century Atlas*, 1897; in *The Times Atlas*, London, 1895, 1896, 1897; in Dr. J. Scott Keltie's map in *The Graphic*, London, August 10, 1901; *et cetera, et cetera*. Dr. Fricker, in *The Antarctic Regions*, not only has two maps with "Wilkes Land"; but he devotes thirteen pages of his book to "Wilkes Land." Hachette's *Atlas de Poche*, Paris, 1894, prints "T. de Wilkes," and it is particularly instructive to find the countrymen of Dumont-D'Urville using the term. Some geographers still use the term "Antarctic Continent." Colton's *General Atlas*, N. Y., 1888, for instance, does so, and also the Hydrographic Office in Washington. Some map makers, however, use neither name. In Black's *General Atlas of the World*, Edinburgh, 1876, there is the complete outline of Wilkes Land, but no American name whatever, and only Adélie, Clarie and Sabrina Land. In the *Encyclopædia Britannica*, ninth edition, article *Polar Regions*, is a map with the names given by Wilkes and D'Urville, as well as Sabrina Land, but with neither "Antarctic Continent," nor "Wilkes Land." The latest English semi-official map in *The Antarctic Manual*, 1901, "Antarctic Ocean, Sheet No. 1," marks Adélie Land, Côte Clarie, and Sabrina Land, and of all Wilkes' discoveries only "Knox's Land."

There is little doubt, however, I think, that in due time, in accordance with the excellent precedent of commemorating the names of explorers, the name

already justly in general use among geographers will prevail, and that the coasts from Ringgold Knoll to Termination Land will be known by the generic name of "Wilkes Land."

III.

VOYAGES SUBSEQUENT TO THE DISCOVERY OF THE CONTINENT OF ANTARCTICA.

The great discovery by Wilkes and his men that there is probably a continental mass of land at the South Pole, may be fitly looked on as the termination of the second period of antarctic research, and the third period includes the voyages from this epoch-making cruise to the present time.

The first expedition of the third period was commanded by Sir James Clark Ross, R. N.,²⁴⁵ who had never before been in the Antarctic, and Captain Crozier; and it confirmed in a striking manner the results obtained by the U. S. Exploring Expedition.

It was announced in England in 1836²⁴⁶ that the

²⁴⁵ Ross, Captain Sir James Clark, R. N.: *Voyage of Discovery and Research in the Southern and Antarctic Regions*, during the years 1839-43; London, John Murray, 1847.

McCormick, R., Deputy Inspector General, R. N., F. R. G. S.: *Voyages of Discovery in the Arctic and Antarctic Seas*, etc., London, Sampson Low, Marston, Searle and Rivington, 1884: (Amer. Geog. Soc.).

²⁴⁶ *The Journal of the Royal Geographical Society of London*, Volume the Sixth, 1836, London, John Murray, MDCCCXXXVI., page 440: "X, New Expedition to the Pacific and Antarctic Oceans." This article says "It is expected that the expedition will be ready to start in the spring of 1837" and "Subordinate to this is the intention of pushing during the fine season as far south as practicable, and of exploring the unknown regions of the Antarctic Ocean."

American expedition under Wilkes was going to the Antarctic, and the English expedition was decided on two years later, in acquiescence to a series of resolutions adopted by the British Association, in August, 1838,²⁴⁷ and the instructions to Ross from the Lords Commissioners of the Admiralty were dated the 14th day of September, 1839.²⁴⁸ Before Ross sailed from Hobart Town, he knew all about Wilkes' cruise and the discovery of the Antarctic Continent, for he had received a long letter²⁴⁹ on the subject and also a rough chart from Wilkes. Ross speaks of the action of Wilkes in the following terms:²⁵⁰ "I felt therefore, the more indebted to the kind and generous consideration of Lieutenant Wilkes, the distinguished commander of the expedition, for a long letter on various subjects, which his experience had suggested as likely to prove serviceable to me * * * and I avail myself of this opportunity of publicly expressing the deep sense of thankfulness I feel to him for his friendly and highly honorable conduct."

He follows this up by a most surprising statement: "That the commanders of each of these great national undertakings should have selected the

²⁴⁷ *Voyage*, etc., Vol. I., page V.

²⁴⁸ *Voyage*, etc., Vol. I., pages XXI-XXVIII.

²⁴⁹ Published in Wilkes' *Narrative*, etc., Vol. II., pages 453-456; and also in Ross' *Voyage*, etc., Vol. I., pages 346-352.

²⁵⁰ *Voyage*, etc., Vol. I., pages 115, 116.

very place for penetrating to the southward, for the exploration of which they were well aware, at the time, that the expedition under my command was expressly preparing, and thereby forestalling our purposes, did certainly greatly surprise me.”²⁵¹ It is necessary to call attention to this passage²⁵² because it appears to be intended to convey the idea that D’Urville and Wilkes had acted unfairly towards Ross. It is not self evident why either the French or the American officer should have avoided sailing towards a certain unknown portion of the earth because an English officer might be coming there a year or two later. Moreover the American expedition had been decided on at least in 1836, and the English expedition only had its *inception* in August, 1838, the very month in which the Instructions of the Government of the United States were issued to Wilkes, and in obedience to which Wilkes made his cruise to the Antarctic.²⁵³ Ross certainly knew these facts when he published his *Voyage* in 1847, for Wilkes had published his *Narrative* in 1845, and Ross had read it, for he cites it repeatedly.²⁵⁴

²⁵¹ *Voyage*, etc., Vol. I., pages 116, 117.

²⁵² Dr. Fricker, for instance, says (*The Antarctic Regions*, page 93): “Ross was naturally and justifiably surprised and annoyed to find his purposes thus forestalled by commanders who were well aware of the preparations for fitting out the expedition under his own command.”

²⁵³ See *ante*, page 139.

²⁵⁴ *Voyage*, etc., pages 116, 274, 295, etc.

Ross sailed from Hobart Town on November 12th, 1840. He selected the meridian of 170° east longitude "on which to endeavor to penetrate to the southward.
* * * My chief reason for choosing this particular meridian in preference to any other was, its being that upon which Balleny had in the summer of 1839, attained to the latitude of sixty-nine degrees, and there found an open sea."²⁵⁵ His ships, the "Erebus" and "Terror," having been thoroughly strengthened, were much more suitable for ice navigation than

Professor Gregory, of Melbourne, a well known English scientist (*The Popular Science Monthly*, New York, 1902, Vol. LX., pages 209-217;—Professor J. W. Gregory, F. R. S.: "Antarctic Exploration") has recently pointed out that Ross was inaccurate and unreliable in many directions. He says: "On his own lines Ross' work was magnificent. His magnetic survey has not been equalled in the Antarctic; his southern record was not passed until 1900; his discovery of Victoria Land and Mounts Erebus and Terror were geographical results of high importance. But Ross' range of interest was narrow; he did not land on the mainland he discovered, and would not let his doctor, McCormick; he advanced erroneous theories of oceanic circulation, assigned wrong temperatures to the sea water, owing to misunderstanding his thermometers; he told us practically nothing of the geology of the Antarctic lands, for the few pebbles he brought back were neglected until they were recently unearthed and described by Mr. Prior."

In the same article, Professor Gregory points out what good work Wilkes did: "Wilkes' work was not only important because he traced this coast line at intervals for 60 degrees of longitude; but the geological collections made by his expedition showed that the land is formed of granites, massive sandstones, and other rocks of continental types."

²⁵⁵ *Voyage*, etc., Vol. I., page 117.

those of Wilkes or D'Urville.²⁵⁶ In consequence, Ross was able to break through the pack, and on January 11th, 1841, in $71^{\circ} 15'$ south latitude "A strong 'land-blink' made its appearance²⁵⁷ in the horizon as the ships advanced, and had attained an elevation of several degrees by midnight. All of us were disposed to doubt that which we so much apprehended, owing to its much paler colour than the land-blinks we had seen in the northern regions, but soon after 2 A. M. the officer of the watch, Lieutenant Wood, reported that the land itself was distinctly seen directly ahead of the ship. * * * It rose in lofty peaks, entirely covered with perennial snow; it could be distinctly traced from S. S. W. to S. E. by S. (by compass), and must have been more than one hundred miles distant when first seen.²⁵⁸ * * * The highest mountain of this

²⁵⁶ It was in these ships that Sir John Franklin made his last, fatal voyage. Mr. Augustus J. C. Hare, in his interesting *The Story of my life*, New York and London, 1901, Vol. IV, page 439, voices neatly the feelings of the opponents of polar exploration: "Sir John Franklin was born at Spilsby * * * And, coming from thence, John Franklin became the most famous of those Arctic travellers whom Wilkie Collins aptly describes as 'the men who go nowhere and find nothing.'"

²⁵⁷ *Voyage*, etc., Vol. I., page 183.

²⁵⁸ This statement of Ross of seeing the "land-blink" at a distance of over one hundred miles is interesting, for it proves that Lieutenant-Commander Ringgold must have seen "the loom over high land" over the Balleny Islands on the 13th of January, 1840, on which date he was less than two degrees of latitude north of them. See *ante*, page 142.

range I named after Lieutenant-Colonel Sabine," etc. The same day Ross christened Cape Adare and Admiralty Range, and the next morning he landed on Possession Island, in $71^{\circ} 56'$ south latitude, $171^{\circ} 7'$ east longitude, "composed entirely of igneous rocks, and only accessible on its western side."²⁵⁹

Ross worked gradually south. On January 15th he named Mount Herschel; on January 17th Coulman Island; on January 21st, in $74^{\circ} 15'$ south latitude, he named Mount Melbourne; on January 27th he was in $76^{\circ} 8'$ south latitude, $168^{\circ} 12'$ east longitude, and landed on an island which he called Franklin Island. On January 28th, "we stood to the southward, close to some land²⁶⁰ which had been in sight since the preceding noon, and which we then called the 'High Island'; it proved to be a mountain twelve thousand four hundred feet of elevation above the level of the sea, emitting flame and smoke in great profusion; at first the smoke appeared like snow drift, but as we drew nearer, its true character became manifest. * * * I named it 'Mount Erebus' and an extinct volcano to the eastward, little inferior in height, being by measurement ten thousand nine hundred feet high, was called 'Mount Terror.'" The eastern cape at the foot of Mount Terror was named "Cape Crozier" and another mountain, a little further south, "Mount Parry."

²⁵⁹ *Voyage*, etc., Vol. I., page 189.

²⁶⁰ *Voyage*, etc., Vol. I., pages 216, 217.

Ross christened this land "Victoria Land," "whose continuity we had traced from the seventieth to the seventy-ninth degree of latitude."²⁶¹ The coast line of Victoria Land must surely be a continuation of the coast line of Wilkes Land, and as, to make a land, there must be some extension in breadth beyond the coast line, and as the extension of Ross' coast is due south of Wilkes Land and only some three or four degrees of latitude distant, the land mass sighted by Ross therefore, even if the whole place is an archipelago, must be a portion, a *hinterland*, of the land mass sighted by Wilkes.²⁶²

Curiously enough, however, Ross seems to have disbelieved in a South Polar Continent, for he denies its existence in these words:²⁶³ "There do not appear to me sufficient grounds to justify the assertion that the various patches of land recently discovered by the American, French and English navigators on the verge of the Antarctic Circle unite to form a great southern

²⁶¹ *Voyage*, etc., Vol. I., page 248.

²⁶² Since I made this statement (*Journal of the Franklin Institute*, 1901, Vol. CLII., page 29), an English scientist, Professor Gregory, has affirmed (*The Popular Science Monthly*, New York, 1902, Vol. LX., pages 209-217:—Professor J. W. Gregory, F. R. S.: "Antarctic Exploration"), undoubtedly quite independently, this very fact: "Two years later the extension of Wilkes Land to the east and the south was proved by the famous expedition of Sir James Clark Ross, which circumnavigated the Antarctic area and passed all previous records by reaching the longitude of 78°."

²⁶³ *Voyage*, etc., Vol. I., page 275.

continent. The continuity of the largest of these 'Terre Adélie' of M. D'Urville has not been traced more than three hundred miles, Enderby's Land not exceeding two hundred miles; the others being mostly of inconsiderable extent, of somewhat uncertain determination and with wide channels between them, would lead rather to the conclusion that they form a chain of islands."²⁶⁴ Of course no one will quarrel with Ross for whatever opinions he may have formed about the lands he saw himself, but it may be well to note that when Ross says that "the others," *i. e.*, "Wilkes Land," are of inconsiderable extent with wide channels and that they form probably a chain of islands, Ross is simply romancing, as he was never

²⁶⁴ That Ross did not believe in a southern continent is well recognized by Mr. G. Barnett Smith (*The Romance of the South Pole*, Thomas Nelson & Sons, London, Edinburgh and New York, 1900, page 173) when he says: "one thing was made evident by Ross and that was that there was no such thing as a southern continent." Sir Clements R. Markham, on the contrary, disagrees with Ross' statement that there is no southern continent, for he says that Ross discovered it (*The Geographical Journal*, 1897, Vol. IX., pages 592-593: "Anniversary address, 1897"): In one short month he [Ross] made one of the greatest geographical discoveries of modern times, amid regions of perpetual ice, including a southern continent, which was named Victoria Land, an active volcano 12,400 feet high, and the marvellous range of ice-cliffs. This may fairly be considered to have been the only real antarctic expedition, for Ross alone, until 1895, forced his way boldly into the polar pack, faced all its dangers, and penetrated far to the south after passing through it."

in a position where he could have sighted the parts of the coast of Antarctica which were seen by Wilkes.

From the great volcanoes, Ross cruised eastward, reaching his most southerly point, $78^{\circ} 4'$ south latitude, on February 2d; and his most easterly point, $77^{\circ} 18'$ south latitude, 167° west longitude, on February 5th. During this part of the trip, the ships coasted along a perpendicular barrier of ice, some forty-five to sixty meters high and more than seven hundred kilometers long. Ross then started northward, and on the 21st his vessels were again near Cape Adare. They kept on north, and on March 4th, passed well to the eastward of the Balleny Islands, being in $66^{\circ} 44'$ south latitude, $165^{\circ} 45'$ east longitude.²⁶⁵ Ross then sailed northward and westward; on March 6th he was in $64^{\circ} 51'$ south latitude, $164^{\circ} 45'$ east longitude, and on March 7th in $65^{\circ} 31'$ south latitude, $162^{\circ} 9'$ east longitude. He then sailed further westward on a track some two degrees north of the track of Wilkes. *Ross was, therefore, first too far east, then too far north, to see any of the lands discovered by Wilkes himself*, as the South Polar Chart, in the second volume of Ross' book and which gives his track, conclusively proves.

Ross states, however, that he sailed over a spot, about northeast of the Balleny Islands, which was charted as land on the chart sent him by Wilkes; and on the strength of this only, he did not lay down Wilkes' discoveries on his South Polar Chart. Ross

²⁶⁵ *Voyage, etc.*, Vol. I., page 269.

devoted many pages of his book to this matter, and, relying—very naturally—on his asseverations and omissions, some Englishmen²⁶⁶ to-day repeat his assertions and omit Wilkes' discoveries from English charts. It is necessary, therefore, to discuss somewhat at length Ross' attacks upon Wilkes. So far

²⁶⁶ The following specimens will serve to show how some writers treat this matter :

Mr. W. J. J. Spry of the Royal Navy (*The Cruise of Her Majesty's Ship Challenger*, New York, Harper & Brothers, 1877, pages 137-139) writes : " And in 1840, Captain Wilkes, in command of the United States exploring expedition, gave forth to the world his discovery of the Antarctic Continent, which he describes as follows : ' In latitude $64^{\circ} 31'$ south, longitude 93° east, we made what we believed to be land to the south and west, at least so far as 'terra firma' can be distinguished when everything is covered with snow' (Note : 'United States Exploring Expedition'). * * * The supposed existence of this continent was, to a certain extent, proved to be erroneous by Sir James C. Ross's expedition the following year sailing over two of the positions assigned to it. For another point of this continent (?) we are now shaping a course." I have not been able to find in Wilkes' *Narrative* the passage given by Mr. Spry in which Wilkes is quoted as saying that " in latitude $64^{\circ} 31'$ south, longitude 93° east, we made what we believed to be land," etc., nor have I traced in Ross' *Voyage* any claim by Ross that he had sailed over *two* of the positions assigned to the Antarctic Continent.

Monsieur Armand Rainaud (*Le Continent Austral, Hypothèses et Découvertes*, Paris, Armand Colin et Cie. 1893, page 477) accepts Ross' views : " A little while after, the testimony of Sir J. C. Ross condemned without appeal (*condamna sans appel*) the imaginations of Wilkes in the same way that in the preceding century the testimony of Cook had ruined the imaginations of Dalrymple. Where Wilkes indicated a land, Ross made a sounding of 600 fathoms without finding the bottom. The naturalists of the 'Challenger' (23 and 26 February 1874)

apparently this has not been done with sufficient thoroughness from a comparison of the original documents, but it is important that some impartial geographers should take up the matter and bring out the truth: and, to this end, it seems well to urge them to study, to compare, and to comment on, the original documents.

likewise saw no trace of Wilkes Land." It may be suggested that there are still a few geographers who would not consider the verdict "condemned without appeal" as final.

Mr. Louis Bernacchi (*The Geographical Journal*, London, 1901, Vol. XVII., pages 478-495; "Topography of South Victoria Land, Antarctic" page 494) is reported as saying in the discussion of his paper: "And then with regard to an ice-barrier to the west of Cape North, of course I have not seen the barrier, and know absolutely nothing about it, but I believe the barrier was seen by Wilkes and Dumont d'Urville. In the first place, I think some of Wilkes' ice-barriers and lands are extremely improbable. Sir James Ross has proved that some of his lands did not exist, so also did the expedition of the *Challenger*. Of course Dumont d'Urville was more reliable, and there is no doubt there is an ice barrier from Cape North westward, and I believe the length of it is about 90 miles." It is only necessary to call attention to the contradiction between Mr. Bernacchi's decidedly positive opinions about the ice barrier, and his statement that he knows absolutely nothing about it.

Sir Clements R. Markham, in the *Encyclopædia Britannica*, ninth edition (American reprint, 1885) article "Polar Regions," says: "At the same time Commander Wilkes of the United States expedition made a cruise to the southward and mapped a large tract of land in the latitude of the Antarctic Circle for which he claimed the discovery. But as a portion of it had already been seen by Balleny and the rest has since been proved not to exist, the claim has not been admitted. * * * In returning to Hobart Town the expedition [Ross] visited the Balleny Islands, and searched in vain for the land which

That Wilkes was justified in laying down land where he did is evident, for the following reasons: On the chart of the Antarctic Continent, published in the first volume of Ross' book in 1847 only, the Balleny

Captain Wilkes had laid down on his chart." He (*The Geographical Journal*, London, 1901, Vol. XVIII., pages 13-25: "Considerations respecting routes for an Antarctic expedition," page 17) also says: "Captain Wilkes, following in the wake of Balleny in 1840, reported distant mountains connecting the discoveries of Balleny and d'Urville and laid down a coast-line of vast extent representing land of continental proportions. But Sir James Ross found himself nearly in the centre of the mountainous patch of land laid down in Lieut. Wilkes's chart. Sir George Nares saw nothing of Wilkes' supposed Termination Land when within 15 miles of it, and there were such discrepancies between the statements of Captain Wilkes and his officers that the matter remains in doubt. It is a question of great geographical interest; but we are only certain of Sabrina Island, Adélie Island with Côte Clarie, and the Balleny Islands. Ross believed that Wilkes's Land was a chain of islands." Let us examine some of Sir C. R. Markham's statements in detail. He says "the rest has since been proved not to exist": When, where and by whom was the proof furnished?—Again "the claim has not been admitted": who is it who has not admitted the claim, and what difference does it make whether he, she, or it, admitted the claim or not?—Further "Ross believed that Wilkes's Land was a chain of islands": but what weight does any belief of Ross about Wilkes Land carry, since Ross had never been there and knew nothing about it!—And also "there were such discrepancies between the statements of Captain Wilkes and his officers": it would be interesting to have these discrepancies pointed out; in my judgment, the statements of Wilkes and his officers tally in all respects; and, what is still more important, they tally with the statements of d'Urville and his officers.—The only argument of Sir C. R. Markham in both his articles is founded on the "land laid down in Lieut. Wilkes' chart"; the *Narrative*, the papers, and the published charts of Wilkes, he passes over in silence.

Islands are laid down by Ross himself.²⁶⁷ North-east of them a land is indicated, which is intersected by Ross' track. The chart also gives the position of the "Vincennes" on the 13th, and a line drawn from this to the Balleny Islands goes almost through the centre of the land. As the "Porpoise" was close to the "Vincennes" on the 13th, the line of vision, in which Ringgold saw the "loom over high land," went straight to the Balleny Isles, which undoubtedly were the cause of this loom.²⁶⁸ On comparing the statement of Ringgold, with the reported discovery of Balleny, therefore, Wilkes must have considered that Ringgold's appearance of land and the Balleny Isles were the same; and he naturally laid them down on the chart, although a little too far north.

Fortunately, also, Wilkes published²⁶⁹ a perfectly straightforward explanation of how this land came to be indicated on the chart he sent to Ross:

"The news of Captain Ross having sailed from England, and his expected arrival, was also communicated to us. In my despatches to the Government I informed them that the discovery was made on the 19th of January, 1840, the day on which we felt confident the land existed, in 154° 30' east longitude.

²⁶⁷ According to his own statement: *Voyage, etc.*, Vol. I., page 287.

²⁶⁸ See *ante*, page 142.

²⁶⁹ *Synopsis of the cruise of the U. S. Exploring Expedition, etc.*, pages 18-27.

In a subsequent despatch from New Zealand, and after I had received the reports from all the vessels, with my own observations, I found we could claim the discovery of land as far east as 160° longitude, a few days prior to the 19th, which I accordingly did.

“During our cruise, as we sailed along the icy barrier, I prepared a chart, laying down the land, not only where we had actually determined it to exist, but those places in which every appearance denoted its existence, forming almost a continuous line from 160° to 97° east longitude. I had a tracing copy made of this chart, on which was laid down the land supposed to have been seen by Bellamy [Balleny] in 165° east; which with my notes, experience, &c., &c., was forwarded to Captain Ross, through Sir George Gibbs, at Sydney; and I was afterwards informed was received by Captain Ross, on his arrival at Hobart Town, some months previous to his going south. The following is a copy:

* * * * *

“As I before remarked, on my original chart I had (laid?) down the supposed position of Bellamy’s Islands or land in 164° and 165° east longitude, and that it was traced off and sent to Captain Ross. I am not a little surprised that so intelligent a navigator as Capt. Ross, on finding that he had run over this position, should not have closely inquired into the statements relative to our discoveries that had been published in the Sydney and Hobart Town

papers, which he must have seen, and have induced him to make (*sic*) a careful examination of the tracks of the squadron, laid down on the chart sent him, by which he would have assured himself in a few moments that it had never been laid down or claimed as part of our discovery, before he made so bold an assertion to an American officer [Captain J. H. Aulick], that he had run over a clear ocean where I had laid down the land. And I am not less surprised that that officer should have taken it for granted, without examination, that such was the fact.

“On reference to Captain Ross’ chart and track, it will be seen he has not approached near enough our positions, either to *determine errors* or *verify results*. I am very far from imputing to Captain Ross any intentional misrepresentation, nor had I any right to expect that the track of the expedition, and its discoveries, should have been laid down on his chart; but it would seem somewhat unusual that the discoveries of others (though of much less importance) should be represented, whilst those of the American expedition were omitted, when it is known that he was in possession of our operations more fully than those of others.”

Ross himself republished²⁷⁰ the second and third paragraphs of this last quotation, but he took no notice of the fact that Wilkes tried to do justice to the Englishman, Balleny, by recognizing and chart-

²⁷⁰ *Voyage, etc.*, Vol. I., pages 286, 287.

ing Balleny's discovery: nor did Ross state that while Wilkes did not write Balleny's name on the chart he sent to Ross, Wilkes also did not write on it any local names on any part of the Antarctic Continent. Ross also did not publish the first and fourth paragraphs of the above quotation, and yet, it seems as if they might have opened his eyes somewhat to the error he was making. That these explanations of Wilkes are absolutely correct, moreover, is easily verified from the writings and the charts of the two explorers.

Wilkes makes no claim in any of his writings to have *discovered* any land east of 160° east longitude. The most easterly land laid down on his published charts was "Ringgold's Knoll" in $157^{\circ} 46'$ east longitude, and this of course is several degrees *west* of the Balleny Islands. That the expedition had sighted land at this spot on January 16th, was not at all a certainty at the time, in fact, not until the observations of the three vessels had been compared, and also because of the more positive proofs of the existence of land afterwards obtained. It was not until January 19th, in $154^{\circ} 30'$ east longitude, that he "was fully satisfied that it was certainly land." An absolutely indisputable proof that this is true is afforded by the article in the *Sydney Herald* of March 13th, 1840, which says that the land was discovered on January 19th, and which twice mentions the longitude as $154^{\circ} 18' E$.

That Ross did not sail over any portion of Wilkes Land can be seen at a glance by comparing the charts of the two explorers. The most easterly land on the charts published by Wilkes is well to the *west* of the Balleny Islands; while on the charts published two years later only by Ross, Ross' course is laid down to the *east* of the Balleny Islands, proving that he passed at least five or six degrees to the eastward of the extremest eastern point of Wilkes Land. It is self evident that Ross knew all these facts when he published his book in 1847, for Wilkes had published his *Narrative* in 1845, and Ross mentions it repeatedly.²⁷¹ Still he paid no attention to the statements nor to the charts published by Wilkes, but quietly started a grievous error.²⁷²

A comparison of the original documents, however, brings out one fact pre-eminently, and that is, that whether Wilkes' work is eventually proved or disproved, yet *none of his discoveries were disproved by Ross, for the simple reason that Ross never was within sighting distance of any part of Wilkes Land.*

²⁷¹ *Voyage*, etc., Vol. I., pages 116, 274, 295, etc.

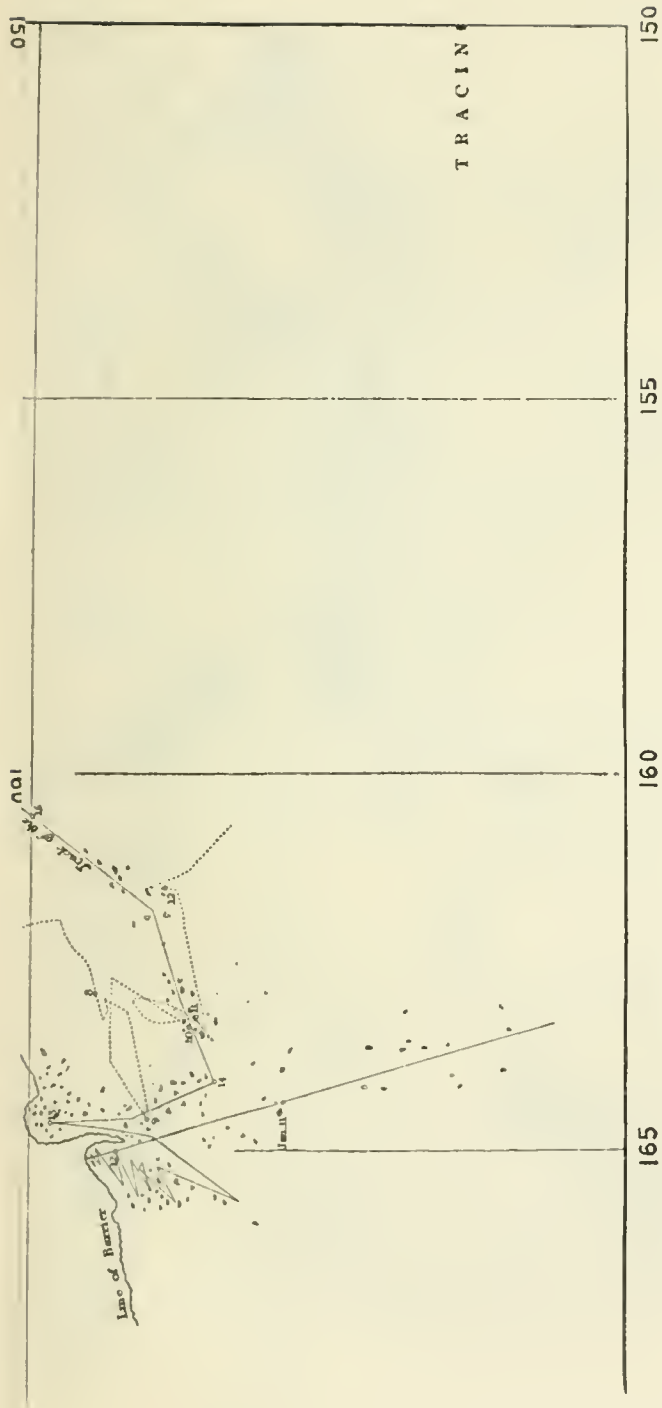
²⁷² The editor of D'Urville's *Voyage* complains forcibly of the treatment meted out to D'Urville in the report of Ross' cruise which he says was published in the *Literary Gazette* of September 16th, 1843, and which he thinks either Ross or one of his officers must have written. The editor says (*Voyage au Pôle Sud*, etc., Tome Huitième, page 230): "L'auteur de ce rapport, dans l'intention évidente de rapporter à son compatriote l'honneur de la découverte de terres australes, a commis une erreur volontaire et grossière."

Ross ²⁷³ sailed again from New Zealand on November 23d, 1841. Icebergs were first seen on December 16th, in $58^{\circ} 36'$ south latitude, $146^{\circ} 33'$ west longitude. Ross entered the pack on December 18th, in $60^{\circ} 50'$ south latitude, $147^{\circ} 25'$ west longitude. He worked his way through the pack until February 2d, when the ships were in $67^{\circ} 29'$ south latitude, $159^{\circ} 1'$ west longitude, where he found more open water. On February 9th the ships were in $70^{\circ} 39'$ south latitude, $174^{\circ} 31'$ west longitude. Ross kept working south and on February 16th was in $75^{\circ} 6'$ south latitude, $187^{\circ} 4'$ west longitude, reaching his most southerly point on February 23d in $78^{\circ} 10'$ south latitude, $161^{\circ} 27'$ west longitude. He was then off the great ice barrier he had seen the preceding year. It averaged thirty meters in height above the water, and soundings in front of it in one place gave a depth of two hundred and ninety fathoms. There was an "appearance of land" at this spot. Ross then returned, keeping along the edge of the pack until about $69^{\circ} 52'$ south latitude, 180° longitude, when the ships ran into open water.

The following year Ross ²⁷⁴ sailed from the Falkland Islands on December 17th, 1842. He met the pack on December 25th, in $62^{\circ} 30'$ south latitude, 52° west longitude. He worked south, and on the eastern coast of West Antarctica, charted a large

²⁷³ *Voyage*, etc., Vol. II., pages 125-213.

²⁷⁴ *Voyage*, etc., Vol. II., pages 321-374.



Reproduction of a portion of the charts published by Lieutenant Wilkes and Sir J. C. Ross. The longitudes and the line of the ice barrier are the same in both. The upper part of the map, reproduced from the chart published by Lieutenant Wilkes in 1845, shows that the most easterly land of which the United States Expedition claimed the discovery was Ringgold Knoll, in $157^{\circ} 46'$ east longitude. The lower part of the map, reproduced from the chart published by Sir J. C. Ross in 1847, shows that the northern track of the "EREBUS" and the "TERROR" was eastward of 161° east longitude, and at least 100 miles distant from any part of Wilkes Land.



Reproduction of a portion of the charts published by Lieutenant Wilkes and Sir J. C. Ross. The longitudes and the line of the ice barrier are the same in both. The upper part of the map, reproduced from the chart, published by Lieutenant Wilkes in 1845, shows that the most easterly land of which the United States Expedition claimed the discovery was Ringgold Knoll, in $157^{\circ} 46'$ east longitude. The lower part of the map, reproduced from the chart published by Sir J. C. Ross in 1847, shows that the northern track of the "Erna" and the "Terror" was eastward of 161° east longitude, and at least 100 miles distant from any part of Wilkes Land.

bay as "Erebus and Terror Gulf," and a high mountain as "Mount Haddington." A little island east of this in $64^{\circ} 12'$ south latitude, $59^{\circ} 49'$ west longitude, was named "Cockburn Island." On this a small flora was obtained, which Dr. Hooker described.²⁷⁵ There were nineteen species, *Mosses*, *Algæ*, and *Lichens*: twelve are terrestrial, three inhabit either fresh water or moist ground, and four are confined to the surrounding ocean. All through January 1843, Ross beat around in the pack to the east of West Antarctica. He got clear of it on February 4th, when he sailed eastward to try to follow Weddell's track. Between the meridians of 10° and 20° west longitude, Ross pushed south, attaining on March 5th, $71^{\circ} 30'$ south latitude, $14^{\circ} 51'$ west longitude, when pack ice stopped him once more. He then sailed north, and on his return voyage searched in vain for Bouvet Island.

Captain Dougherty, in 1841, discovered a small island,²⁷⁶ now known as Dougherty Island, in about $59^{\circ} 25'$ south latitude, $120^{\circ} 20'$ west longitude. This

²⁷⁵ *Voyage*, etc., Vol. II., pages 335-342.

²⁷⁶ According to the "South Polar Chart" by Captain W. J. L. Wharton, R. N., F. R. S., Hydrographer: published at the [British] Admiralty, 20th May, 1887: Small corrections, III, 01: Chart No. 1240. It is a striking fact that the nomenclature of this official British chart is much more reliable than that of many English antarctic charts. Graham Land is given its correct dimensions between Alexander Land and Danco Land. Wilkes Land,

may be the island reported by Captains Swain and Macy.²⁷⁷ The same island "was subsequently seen and verified by Captain Keates in 1859."²⁷⁸

Captain William H. Smiley,²⁷⁹ an American master of a sealing vessel, made a voyage to West Antarctica in 1842; and he may also have made others. At Pendulum Cove, Deception Island, he found a self-registering thermometer, which was left there in 1829 by Captain Foster. Smiley wrote a letter to Lieutenant Wilkes, who says:²⁸⁰ "Captain Smiley, who mentions in his letter to me, that in February, 1842, the whole south side of Deception Island appeared as if on fire. He counted thirteen volcanoes in action. He is of opinion that the island is undergoing many changes. He likewise reports that

from Ringgold Knoll to Knox High Land, is marked "Land reported by Commander Wilkes, U. S. N., 1840." The usual mistake of writing "Clarie" over Cape Carr is made, and "Palmer Land" does not appear, but there is an evident intention to be accurate.

²⁷⁷ See *ante*, pages 75, 76.

²⁷⁸ Fricker, Dr. K.: *The Antarctic Regions*, 1900, page 119.

²⁷⁹ Maury, Lieut. M. F.; U. S. N.: *Explanations and Sailing Directions to accompany the wind and current charts*; Washington, C. Alexander, 1851; pages 287-293: "Letter from Captain W. H. Smyley to Lieut. Maury": (Stadt Bib. Frankfurt A. M.). This gives hydrographic notes about many voyages of Captain Smiley.

²⁸⁰ *Narrative U. S. E. E.*, Vol. 1., pages 144, 145.

Palmer's Land consists of a number of islands, between which he has entered, and that the passages are deep, narrow and dangerous."

Captain Smiley wrote another letter to Lieut. Maury in which he says:²⁸¹ "You can see by reference to the book published by Commodore Wilkes, that the extreme cold had but in one instance been as low as 5° below zero. This I ascertained from a self regulating thermometer, in latitude 63°, and gave him. Since that time, it has never been so low. The heat I could not ascertain, as the index in the tube shifted while I was lifting the instrument up. I tried to procure one sometime ago in New York, but could not find one. I intended to have placed it in a much higher latitude, as very little is known about either extreme of temperature on the land. For instance, many suppose that Palmer's Land is a continent, and connects with the land laid down by Wilkes; however, this is not the case, for I have sailed round Palmer's Land and far south of it. * * * Owing partly to negligence and partly to disasters, I have no logs or books which will be of use to you."²⁸²

²⁸¹ *Explanations*, etc., page 292.

²⁸² It is certainly unfortunate that Smiley left such imperfect records, as he evidently did a good deal of exploring and he may have sailed through passages which now are not known. Mr. Henryk Arctowski (*The Geographical Journal*, London, 1901, Vol. XVIII., page 368) hints that Smiley may have sailed through Gerlache Strait, but his routes can probably never be ascertained.

Lieutenant T. L. Moore,²⁸³ commanding the "Pagoda," sailed from Simons Bay on January 9th, 1845. On the 25th, in $53^{\circ} 30'$ south latitude, $7^{\circ} 30'$ east longitude, he met the first icebergs. Then he sailed over the place where Bouvet Island was laid down on the charts, but could not see any land. In $60^{\circ} 43'$ south latitude, $3^{\circ} 45'$ east longitude, he fell in with a singular rock, or rock on an iceberg; the mass of rock was estimated at about sixteen hundred tons; the top was covered with ice and did not appear to have any visible motion, with a heavy sea beating over it; it had a tide-mark round it. On the evening of February 11th, in $67^{\circ} 50'$ south latitude (the highest latitude attained), $39^{\circ} 41'$ east longitude, Moore fell in with heavy pack ice, extending as far as could be seen from the masthead, and the weather becoming thick, he was obliged to work the ship off, being then only seventy miles from Enderby Land. Later they got within fifty or sixty miles, but saw no indications of land. W. D. says of this: "The ship was at one time within eighty miles of Enderby Land; but

²⁸³ *The Nautical Magazine and Naval Chronicle for 1846*, London, Simpkin, Marshall and Co., pages 21, 22: "Magnetic Voyage of the Pagoda: Extract of a letter from Lieut. T. L. Moore, R. N.": (Franklin Inst., Pub. Lib. Boston).

Colburn's United Service Magazine, London, 1850, Part II., pages 201-208:—W. D.: "The Antarctic Voyage of Her Majesty's hired barque Pagoda": (Mercantile Lib. Philadelphia). According to Dr. Mill (*The Antarctic Manual*, 1901, page 541) the author's name was Walter Dickson.

no indication of such proximity was visible. There were no icebergs nor blink, nor any observable change in the aspect of water or sky."

The "Pagoda" continued on an easterly course, encountering comparatively little ice until 64° south latitude, 50° east longitude, where there was a strong ice blink. On March 6th they passed a chain of icebergs and loose ice, and the next morning the ship was surrounded by bergs and pack-ice behind which appeared a high ridge of ice or land, which could be seen only at intervals on the clearing up of the squall, and then only for a short time. From that time the ice got thicker every day; at times more than one hundred bergs were seen in a day, one berg being some nine kilometers in length and forty-five meters high. On March 20th they were driven out of the 6th (*sic*) degree of latitude and 98° east longitude by heavy ice, and the appearance of pack ice in the S. E., and thereupon they stood northward. Lieutenant Moore says: "In this trip we passed more icebergs than in the three former trips, and likewise have run over more degrees of longitude, inside of sixty, than any ship has done before." The voyage of the "Pagoda" is noteworthy, because of the doubts it throws about the existence of Enderby Land.

Captain J. J. Heard,²⁸⁴ an American, discovered the

²⁸⁴ Maury, M. F. [Matthew Fontaine], L.L.D., Lieut. U. S. N.: *Explanations and Sailing Directions to accompany the Wind and*

Heard Island group in 1853. His log²⁸⁵ says: "Nov. 25. Pleasant breezes and passing snow squalls; latter part clear. The first clear weather we have had for 20 days. At 8.30 A. M. made land; at first took it for icebergs, as no island is laid down on my chart, nor in the epitome. At 11 A. M., the clouds cleared away, showing it to be an island; at noon the eastern end bore, per compass, N. N. E. 20 miles; the western end bore, per compass, N. by W. about 20 miles. I make the west end of the island $74^{\circ} 15'$ E. long.; east end $74^{\circ} 40'$; lat. $53^{\circ} 10'$. Near the centre of the island a high peak, 5,000 feet high. Large number of birds."

Lieutenant Maury mentions the discovery of these islands as follows:²⁸⁶ "Another caution to navigators is necessary in this trade, that have a fancy on the outward passage, to run down their longitude between the parallels of 51° and 53° . There is a group of newly discovered and not accurately determined islands in the way. They are between the parallels of $52^{\circ} 53' 36''$ and $53^{\circ} 12'$ S., and the meridians of $72^{\circ} 35'$ and $74^{\circ} 40'$ E. They were first seen by Captain Heard, of the American barque *Oriental*, November 25, 1853. On the 12th June, 1854, the fact

Current Charts, etc., Seventh Edition, Philadelphia, E. C. and J. Biddle, 1855: (Lib. Co., Philadelphia).

²⁸⁵ *Explanations*, etc., pages 763-768: "Abstract Log of the Barque *Oriental* (J. J. Heard). From off St. Roque to Melbourne, Australia, 1853."

²⁸⁶ *Explanations*, etc., page 862.

was duly reported by me to the government of the United States, and the importance of sending a vessel of the navy to look after them and fix their position was urged upon the Navy Department. Since their discovery by the *Oriental*, they have been seen and reported by four English vessels, viz.: The *Samarang*, Captain McDonald, January 3, 1854; the *Earl of Eglinton*, Captain Hutton, 1st December, 1854; the *Lincluden Castle*, Captain Rees, 4th December, 1854; and the *Herald of the Morning*, Captain Attwaye, 3d and 4th December, 1854. Captain Heard reports a peak of the island he saw, to be 5000 feet high."

Dr. A. Petermann²⁸⁷ states that the discovery was really due to the "Great Circle Sailing Principle" which was invented by Lieut. Maury, and that it was while following this principle that these various captains strayed on these islands. Dr. Petermann's Chart of 1858 shows that each of the five captains who first saw the islands called the main island after himself. Dr. Neumayer²⁸⁸ suggested naming them "König

²⁸⁷ *Dr. A. Petermann's Mittheilungen*, etc., Gotha, 1858, pages 17-33:—A. Petermann: "Die Sogenannten 'König-Max-Inseln,' Kerguelen, St. Paul, New-Amsterdam, u. s. w." With charts.

Dr. A. Petermann's Mittheilungen, etc., Gotha, XX., 1874; pages 466-467: "Die Aufnahme der Heard und McDonald Inseln und die Erforschung der Süd Polar Regionen."

²⁸⁸ Dr. Neumayer has written a number of articles about the Antarctic, among which are: *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, Siebenter Band, 1872, pages 120-170: "Die

Max Islands" in 1857, and Dr. Petermann objected. The islands were finally named Heard and McDonald Islands by the members of the "Challenger" expedition. Small fleets of ships went to these islands about the beginning of 1855 to catch sea leopards and sea elephants, which were found there at that time in countless numbers.

Captain William Grant²⁸⁹ in the "Day Spring," on December 23d, 1855, in 56° 50' south latitude, 40° west longitude, sighted an icy barrier of flat topped icebergs, apparently about one hundred and twenty to one hundred and fifty meters high, and had some difficulty in sailing his ship among them. There were seldom less than ten or fifteen ice islands in sight until December 27th, in 52° 40' south latitude, 20° west longitude.

Captain Dallmann,²⁹⁰ a German, in the steamship "Groenland," was seal hunting from November 17th,

Erforschung des Süd Polar Gebietes." *Annalen der Hydrographie und Maritimen Meteorologie*, Einundzwanzigster Jahrgang, 1893, Berlin, pages 449-467: "Die neuesten Fortschritte der Bestrebungen zu Gunsten einer wissenschaftlichen Erforschung der Antarktischen Region." Dr. Neumayer has recently published a book, which I have not seen: *Auf zum Südpol*, Berlin, 1901.

²⁸⁹ Rosser, W. M.: *Notes on the Physical Geography and Meteorology of the South Atlantic*, London, James Imray and Son, 1862, page 94.

²⁹⁰ *Verhandlungen des Vereins für naturwissenschaftliche Unterhandlung zu Hamburg*, Band V., Hamburg, 1883, pages

1873, to March 4th, 1874. On January 8th, in about $64^{\circ} 45'$ south latitude, Dallmann landed on one of the western islands of West Antarctica. On January 10th he found a deep bay, where he appears to have landed in about $64^{\circ} 55'$ south latitude; this bay terminated in a strait which stretched away as far as the eye could see.²⁹¹ The land appeared to consist of islands, for Dallmann saw several streaks of blue sky, which seemed as if they must be over straits. The land was high and mountainous, and the coast between the capes was filled with a high upright ice

118-128, 130-136:—Schiffskapitain A. Schück: "Die Entwicklung unserer Kenntnisse der Länder im Süden von Amerika."

Dr. A. Petermann's Mitteilungen, etc., Gotha, XXI., 1875, page 312; "Deutsche Entdeckungen am Südpol."

²⁹¹ A chart of West Antarctica with corrections made by Captain Dallmann and Dr. Petermann themselves is now at "Justus Perthes' Geographischer Anstalt," Gotha: this chart shows the entrance to a great strait in about the position of the southern end of Gerlache Strait. A map by L. Friederichsen, published in the *Mitteilungen der Geographischen Gesellschaft in Hamburg*, 1891-92, Hamburg, 1895: "Original Karte des Dirck Gherritz Archipels," also shows Dallmann's Strait or Bay under the name "Bismarck Str."

Dr. H. Wichmann (*Dr. A. Petermann's Mitteilungen*, Gotha, Vol. 46, 1900, page 172; and Vol. 47, 1901, page 48) calls attention to the fact that the strait explored by the Belgica expedition was the one seen by Dallmann. Mr. Henryk Arctowski (*The Geographical Journal*, London, 1901, Vol. XVIII., page 368) on the contrary, thinks that "as to the strait, Dallman could not, from his position, have seen anything other than the entrance to the great fiord called by de Gerlache, Flanders bay."

wall, from which large pieces frequently broke off. The strait has been called Bismarck Strait, but a better name would be Dallmann Strait; it is perhaps the southern end of Gerlache Strait or it may prove to be a bay or a strait further south. Friederichsen charts Bismarck (Dallmann) Strait as some distance south of 65° south latitude, while Gerlache Strait begins some distance north of 65° south latitude. If Dallmann Strait is not Gerlache Strait it may perhaps separate Danco Land from Graham Land, and it may perhaps communicate with the indentation, "Larsen Bay," sighted on the east coast of West Antarctica by Larsen. Dallmann sailed north from this strait and came to the Shetlands and the Powell Islands. He found all the charts extremely unreliable.

In 1874, Captain George S. Nares, R. N., in command of the "Challenger,"²⁹² on her deep-sea sounding and dredging expedition, after a stop at Ker-

²⁹² *Report on the Scientific Results of the Voyage of H. M. S. Challenger*: prepared by Sir C. Wyville Thomson and John Murray; London, 1885; *Narrative*, Vol. I., pages 396-452.

Spry, W. J. J., R. N.: *The Cruise of Her Majesty's Ship Challenger*, London, Sampson Low, Marston, Searle and Rivington, 1877.

Campbell, Lord George: *Log Letters from "The Challenger,"* London, Macmillan and Co., 1876.

Wild, John James: *At Anchor, A Narrative of Experiences Afloat and Ashore during the voyage of H. M. S. Challenger*, London, Marcus Ward and Co., 1878, pages 59-78.

guelen Island, sailed southeast and crossed the Antarctic Circle. On February 23d, 24th and 25th, 1874, the "Challenger" was on the outskirts of the pack, reaching $64^{\circ} 18'$ south latitude, $94^{\circ} 47'$ east longitude. The accounts of the different writers disagree in various minor respects, but they agree in stating that the pack was too heavy for an undefended ship to enter, and also that Termination Land was not sighted. The official account is that of Sir John Murray, who says: "After getting clear of the pack at 11 A. M. [25th] the ship sailed along its edge until noon, being from 10 A. M. until that time within about fifteen miles of the supposed position of Wilkes' Termination Land, but neither from the deck nor masthead could any indication of it be seen. The limit of vision as logged was twelve miles, and had there been land sufficiently lofty for Wilkes to have seen it at a distance of sixty miles (which was the distance he supposed himself off it) either the clouds capping it or the land itself must have been seen. If Wilkes' distance was overestimated, that of the *Challenger* would be increased, and it may still be found, but as the expression in Wilkes' journal is 'appearance of land was seen to the southwest, and its trending seemed to be to the northward,' and not that land was actually sighted, and a bearing obtained, it is probable that Termination Land does not exist; still it is curious that pack ice and a large number of bergs should

have been found in nearly the same position as by Wilkes in 1840, and this would seem to indicate that land cannot be very far distant."

It is worth noting that, as Dr. Murray justly says, Wilkes only speaks of an "appearance of land" at this spot. The most important geographical result of the "Challenger's" southern jaunt, was to prove that there was a floating ice barrier in 1874 in exactly the same situation where there was a floating ice barrier in 1840.

In 1874-1875²⁹³ a party of American, another of English, and a third of German scientists, spent part of the southern summer on Kerguelen Island, principally occupied in making observations in connection with the transit of Venus.

Dr. K. Schrader commanded a German scientific expedition²⁹⁴ which was sent to South Georgia in 1882. The expedition arrived there on "S. M. S. Moltke" in August; spent a whole year at Moltke Harbor;

²⁹³ *Bulletin of the United States National Museum*; Nos. 2 and 3; Washington, Government Printing Office, 1875 and 1876:—Kidder, J. H., M. D.: "Contributions to the Natural History of Kerguelen Island."

²⁹⁴ Prof. Dr. Neumayer and Prof. Dr. Börgen: *Die Internationale Polarforschung*, 1882-1883; "Die Beobachtungs-Ergebnisse der Deutschen Stationen; Band II.; Süd-Georgien"; Berlin, A. Asher, 1886: With accompanying maps and plates: (Grossherz. Hof Bib. Darmstadt).

and left there in August 1883, on "S. M. S. Marie." The observations were principally meteorological and magnetic; but some astronomical work was done, and a careful map made of South Georgia in the neighborhood of the German station.

Some observations made by shipmasters about icebergs in southern latitudes are worth noting.²⁹⁵ Icebergs are constantly found as far north as 40° south latitude; on several occasions they have been seen near the Cape of Good Hope in 34° south latitude; and on April 30, 1894, the master of the "Dochra" saw a small piece of ice in 26° 30' south latitude, 25° 40' west longitude. Some of these bergs were reported as of tremendous size: the captain of the "Drumcraig" saw one 100 meters high and 40 to 48 kilometers long in 49° 34' south latitude, 45° 53' west longitude; and Mr. Towson tells of a berg seen by twenty-one ships in 1854-1855, between 40° and 44° south latitude, and 20° to 28° west longitude, which was "of horizontal dimensions of 60 by 40 miles." It was reported to be of the form of a hook, the longer shank of which was 60 miles, the shorter 40 miles, and embayed between these mountains of ice was a space of water 40 miles across."

²⁹⁵ Gray, W. T., M. S., U. S. Hydrographic Office: "*The Chronology and Geographical Distribution of Icebergs in the Southern and Antarctic Oceans.*"

In 1892-1893, four Dundee whalers, the "Active," the "Balaena," the "Diana," and the "Polar Star," made a cruise to the Antarctic.²⁹⁶ The ships made no big geographical discovery, hunting for seals on the eastern coast of West Antarctica, north of 65° south latitude. Mr. Murdoch, an artist, made some interesting notes about antarctic color, however, which show that the Antarctic is not as black as painted. For instance, he says:²⁹⁷ "The reader must draw on his fancy for the colouring: the clouds soft warm grey, the crags of the berg to the right a purple lead colour, the slope dull white; the berg to the left pale violet, with two or three upright clefts of deep blue, along the top an edge of pure white; between the bergs a third appears light emerald green. The floating ice in front, some parts creamy white, like broken marrons, others dead marble white, and two or three of vivid sky-blue, frosted with white; the sea an umber colour, with lavender sheen."

²⁹⁶ *The Scottish Geographical Magazine*, Vol. X., Edinburgh, 1894; pages 57-62:—Bruce, William S.: "The Story of the Antarctic;" pages 62-69:—Donald, Dr. C. W.: "The late expedition to the Antarctic."

The Geographical Journal, Vol. VII., 1896: "Cruise of the 'Balaena' and the 'Active' in the Antarctic Seas, 1892-93;" pages 502-517:—I. Bruce, William S.: "The Balaena;" pages 625-643:—II. Donald, Charles W., M. D.: "The Active."

Murdoch, W. G. Burn: *From Edinburgh to the Antarctic*, Longmans, Green and Co., London and New York, 1894.

²⁹⁷ *From Edinburgh to the Antarctic*, page 286.

Captain Larsen, a Norwegian sealer, made a cruise in 1892-1893 in the "Jason," on the eastern coast of West Antarctica.²⁹⁸

The following season, Captain Larsen made a longer cruise²⁹⁹ in the same vessel, landing at Cape Seymour on November 18th. He says: "When we were a quarter of a mile from the shore and stood about 300 feet above the sea, we began to see the petrified wood more frequently. We took several specimens of these stems with us: the wood looks as if it might be from deciduous trees. One recognized the bark with the branches and the year-rings of the logs, which lay slantingly in the soil. Some of the wood looked as if it had been thrown out of the water, while some of it seemed as if it could not have been in the water, because in the first we found petrified worms, while in the other we did not find any. At other places we found balls

²⁹⁸ Murdoch, W. G. Burn: *From Edinburgh to the Antarctic*.

²⁹⁹ *Mittheilungen der Geographischen Gesellschaft in Hamburg*, 1891-92; Heft II., Hamburg, L. Friederichsen & Co., 1895; pages 245-298:—Dr. Johannes Petersen: "Die Reisen des 'Jason' und der 'Hertha' in das Antarktische Meer 1893/94" etc.

Norske G. S. Aarbog: 5., 1893-94, pages 115-131:—Larsen, Kapt. C. A.: "Nogle optegnelser af sael og hvalfanger 'Jasons' reise i Sydishavet 1893 og 1894."

Geographical Journal, London, 1894, Vol. IV., pages 333-344: "The Voyage of the Jason to the Antarctic Regions."

Dr. A. Petermann's Mittheilungen, etc., Gotha, 40 Band, 1894, pages 139-141:—A. Schück: "Das neu entdeckte Land im Antarktischen Gebiet."

formed of sand and cement which lay upon pillars of the same kind. We collected in several places some fifty of them; they had the appearance of having been made by the hand of man." These discoveries are noteworthy, for they seem to be the only thing of the kind so far noticed in Antarctica.

From Cape Seymour, the "Jason" first sailed east, then returned and went south along the eastern coast of West Antarctica. Larsen christened this coast "King Oscar II. Land" and Foyen Land.³⁰⁰ His down track was near 60° and 61° east longitude, and his most southern point, 68° 10' south latitude, was reached on December 6th, 1893.

On his return north, Larsen landed on December 11th, on Christensen island, where there was a small, active volcano, in 65° 5' south latitude, 58° 40' west longitude. From here he saw five small islands lying about northwest, on one of which was an active volcano. In a north or northwestern direction he could not see any land west of Cape Foster, although the later christened Danco Land must be not far distant to the west. Larsen's observation is noteworthy as being directly the opposite of the usual reports of appearances of land in the Antarctic. It is possible that this open space is the southern extremity of the bay or strait which was discovered by Nat. B. Palmer and christened "Orléans Channel"

³⁰⁰ It is probable that this coast was sighted by Morrell. See *ante*, pages 102, 105.

by D'Urville: it may also communicate with the strait reported by Dallmann. This bay does not appear to have received a name as yet, and it would seem only just to call it "Larsen Bay."

Captain Evensen,³⁰¹ a Norwegian sealer, in November 1893, cruised in the "Hertha" along the west coast of West Antarctica. He passed Adelaide Island and the Biscoe Islands, which were almost free from ice, and sighted Alexander Land, which was surrounded by pack ice. He reached 69° 10' south latitude, 76° 12' west longitude; the absence of ice at this early period of the southern summer being the noteworthy feature of his voyage.

Captain Morten Pedersen, with the "Castor," was in company with Evensen for part of this journey, and went at least as far as 64° 23' south latitude, 53° 20' west longitude.

In 1894-1895, the Norwegian steam whaler "Antarctic" made a cruise to East Antarctica.³⁰² It started

³⁰¹ *Mittheilungen der Geographischen Gesellschaft in Hamburg*, 1891-92; Heft II., Hamburg, L. Friederichsen & Co., 1895; pages 245-298:—Dr. Johannes Petersen: "Die Reisen des 'Jason' und der 'Hertha' in das Antarktische Meer 1893/94" etc.

³⁰² Bull, H. J.: *The Cruise of the "Antarctic" to the South Polar Regions*; Edward Arnold, London and New York, 1896.

Geographical Journal, London, 1895, Vol. V., pages 583-589:—Borchgrevink, C. Egeberg: "The 'Antarctic's' Voyage to the Antarctic."

from Melbourne on September 20th, 1894. On November 6th, they saw such an immense ice island that it was mistaken for land and called Svend Foyn Island. After some cruising, the "Antarctic" reached, on December 14th, the Balleny Islands from the northeast; then, after much trouble with the ice, on January 16th, Cape Adare; and on January 18th, Possession Island, on which several members of the expedition landed. On January 22d the "Antarctic" was southeast of Coulman Island, in 74° south latitude. On January 23d, the expedition was back at Cape Adare, where a landing was effected, the first on Victoria Land. Some cryptogamic vegetation was found on Possession Island and also at Cape Adare, and a small number of whales, supposed to be right whales, and many blue whales were seen during the cruise.

Lieutenant Adrien de Gerlache, of the Belgian Navy, in 1898-1899, led an important expedition to the Antarctic.³⁰³ The "Belgica" left Staaten Island

*Transactions of the Royal Geographical Society of Australasia, Victorian Branch, Vol. XII.-XIII., 1896, pages 73-100:—*Kristensen, Captain Leonard: "Journal of the Right-Whaling Cruise of the Norwegian Steamship 'Antarctic' in Southern Seas."

³⁰³ Cook, Frederick A., M. D.: *Through the First Antarctic Night*, New York, Doubleday & McClure Co., 1900. Appendix No. VI. of this book: "The possibilities of Antarctic Exploration," touches on the possible political rights of nations in Antarctica: the views expressed in this essay are undoubtedly correct.

on January 13th, 1898, sighted the South Shetlands a week later, then crossed Bransfield Strait, and on the afternoon of January 23d was off the coast of Palmer Archipelago. Here the expedition entered the supposed Hughes Bay, which proved to be the mouth of the strait discovered by Nathaniel B. Palmer in 1821, and which compares in size with the Strait of Magalhaês. It was called Belgica Strait. On the east is a land which was named

Société Royale Belge de Géographie, Bulletin; Vingt-quatrième Année, 1900, No. 1. This contains:—

I. "Expédition antarctique belge."

II. Lecoinge, G.: "Aperçu des travaux scientifiques de l'Expédition Belge."

III. Lecoinge, G.: "L'hydrographie dans le détroit de 'la Belgica' et les observations astronomiques et magnétiques dans la zone australe."

IV. Arctowski, H.: "Géographie physique de la région visitée par l'expédition de 'la Belgica.'"

V. Racovitza, E. G.: "La vie des animaux et des plantes dans l'Antarctique."

Bulletin de la Société Royale de Géographie d'Anvers, 1900, Tome XXIV., pages 25-51:—Lecoinge, Georges: "Expédition Antarctique Belge."

Société Royale Belge de Géographie, Bulletin, Vingt-quatrième Année, 1900, pages 365-531:—Gerlache, A. de: "Notes sur les expéditions * * * aux régions circumpolaires voisines du méridien du Cap Horn" and "Relation sommaire du voyage de la Belgica."

The Geographical Journal, Vol. XVII., 1901, pages 150-180:—Arctowski, Henrik: "Exploration of Antarctic Lands."

The Geographical Journal, Vol. XVIII., 1901, pages 354-394:—Arctowski, Henryk: "The Antarctic voyage of the 'Belgica' during the years 1897, 1898, and 1899."

“Terre de Danco,” after a Belgian officer of the expedition, who died on June 5th, 1898. On the west is an archipelago, and the action of the Belgians does them credit, for recognizing how much honor is due to Palmer as a discoverer in this portion of the Antarctic, they christened this archipelago, “Archipel de Palmer,” and so marked it on their charts.³⁰⁴

✓ Over a hundred islands were discovered in Gerlache Strait, on both sides of which are many peaks, and great ice and snow masses. Many names were bestowed, among which may be mentioned Liège, Gand, Braband, Anvers, and Wiencke Islands. The officers made several landings and many discoveries, and instead of raising flags to take possession of newly-discovered lands, they decided that the first chart of a new country was as good a deed to the title of land, as the formality of pinning a bit of bunting to a temporary post and drinking to the health of a royal ruler. Mr. Arctowski³⁰⁵ found an

³⁰⁴ Lieutenant de Gerlache, in his papers in the *Société Royale Belge de Géographie, Bulletin*, 1901, has applied the name of “Gerlache Strait” to “Belgica Strait,” “Gerritz Archipelago” to the islands west of the strait, and “Palmer Land” or “Trinity Land” to the northern coast of the mainland. “Gerlache Strait,” it seems to me, should be adopted. “Gerritz Archipelago” will have to be given up, and “Palmer Archipelago” retained, this including “Trinity Island.”

³⁰⁶ Mr. Henryk Arctowski has published a number of scientific papers about the Antarctic. Among them may be cited :

insect here, which is probably the first one reported from Antarctica; it was almost microscopic in its dimensions. In about three weeks' time, the "Belgica" sailed without serious difficulty more than three hundred kilometers southwesterly through Gerlache Strait. To the east the shore line of Danco Land was unbroken: there were many deep indentations, but no passage into the Atlantic. A continuous wall of ice, from fifteen to thirty meters high, fronted the coast everywhere. Danco Land is from six hundred to twelve hundred meters high, with mountains farther inland, perhaps eighteen hundred meters in altitude. Every valley and every surface which was not perpendicular was buried under a sheet of ice. The "Belgica" was unable

Expédition Antarctique Belge: "Résultats du voyage du S. Y. Belgica; Météorologie," Anvers, J. E. Buschmann, 1901.

Sur les Aurores Australes et Boréales, Bruxelles, P. Weissenbruch, 1901.

Ciel et Terre, 20^{ème} année: "Résultat préliminaire des observations météorologiques," etc.

Notice préliminaire sur les sédiments marins, etc., Bruxelles, Hayez, 1901.

Sur les icebergs tabulaires des régions antarctiques: Les calottes glaciaires des régions antarctiques: Notice sur les aurores australes observées pendant l'hivernage de l'expédition antarctique belge: Sur les périodes de l'aurore australe: Sur l'ancienne extension des glaciers dans la région des terres découvertes par l'expédition antarctique belge, etc.: Paris, Gauthier-Villars.

Arctowski, Henryk and Thoulet, J.: *Expédition Antarctique Belge: "Résultats du Voyage du S. Y. Belgica; Océanographie,"* Anvers, J. E. Buschmann, 1901.

to follow the coast far enough south to determine whether Danco Land is continuous with Graham Land. On February 13th the "Belgica" was fairly through Gerlache Strait, and for the next few days sailed southwest through an icy ocean, obtaining glimpses of the distant coast of Graham Land. On February 16th, 1898, the expedition passed Alexander Land or Islands, after which they did not sight land.

De Gerlache now tried to force his way south and west, and succeeded to a certain extent in doing so; but as a result the ship was frozen in and consequently wintered in the pack, from which it was finally liberated in March 1899. The men suffered severely from the absence of sunlight and the lack of fresh food. They were at last driven to eat penguins, whose flesh Dr. Cook describes as appearing to be made up of an equal quantity of mammal, fish and fowl, and as tasting like a piece of beef, an odoriferous codfish, and a canvas back duck, roasted in a pot, with blood and cod-liver oil for sauce. The furthest southern point, $71^{\circ} 36'$ south latitude, $87^{\circ} 33'$ west longitude, was reached on May 31st, 1898. Nothing was seen of Peter I. Island, and the course of the ship together with the easy movement of the ice pack, led Dr. Cook to infer that probably there is no land very near Captain Cook's nor Lieutenant Walker's furthest points.

Perhaps the most important discovery of the Belgian expedition is that of a continental tableland

or plateau situated between 75° and 103° west longitude and 70° to $71^{\circ} 36'$ south latitude. The depth of this continental plateau, from two hundred to five hundred meters, with an abrupt fall to fifteen hundred meters towards the north, shows that this region also has undergone the depressive movement, which was noticed in the lands of Gerlache Strait. The continental plateau rises gently towards the south and lowers in its eastern portion towards the north to connect with the continental plateau of West Antarctica. It must connect in like manner fifty degrees farther towards the west with the continental plateau of East Antarctica. This would tend to show that there is a continuous or uninterrupted continental mass across the south polar regions, and the discovery made by the "Belgica" gives a serious support to the hypothesis of an antarctic continent. The terreous nature of the sediments of the continental plateau and neighboring regions, which contain, besides a grayish slime, a strong proportion of sand, gravel, and a number of pebbles of rounded form, are in decided support of this hypothesis. The meteorological observations also show that there must be a great antarctic ice-cap. The minimum temperature, -43° , was observed in September; the maximum, $+2^{\circ}$, in February. The month of July, with an average of -22.5° , was the coldest of the year; the month of February, with an average of -1° ,

was the warmest. The mean temperature of the year was -9.6° , an extraordinarily low figure for the latitudes reached. This low temperature can only be explained by the absence of land towards the north, and the presence of an antarctic continent entirely covered with ice to the south. The hypothesis is based upon a fact which was observed by the expedition. Every time the wind blew from the north the temperature rose, even in midwinter, to 0° , but did not ascend higher. As soon as the wind shifted and blew from the south, the thermometer descended abruptly, even in the middle of summer, to a low temperature.

The "Belgica" expedition brought back perhaps more scientific data about the Antarctic than any other expedition so far, and the captain and members deserve high praise for their labors.

Professor Chun³⁰⁶ and Captain Krech, in 1898-1899, led the German deep-sea expedition in the

³⁰⁶ Chun, Carl: *Aus den Tiefen des Weltmeeres*; Jena, Gustav Fischer, 1900. A good book; beautifully illustrated.

Zeitschrift der Gesellschaft für Erdkunde zu Berlin; Band XXXIV., Jahrgang 1899, Berlin, W. H. Kuhl, 1899, pages 75-192: "Die Deutsche Tiefsee-Expedition:—A: by Professor Dr. Chun:—B: by the Oceanographer, Dr. Gerhard Schott:—C: by the Navigating officer, Walter Sachse": (Senkenbergsche Bib. Frankfurt A. M.).

The Geographical Journal, London: Vol. XII., 1898, pages 494-496; Vol. XIII., 1899, pages 297, 298; 640-650; Vol. XV., 1900, pages 518-528.

“Valdivia.” Starting from Cape Town on November 13, 1898, Chun steered south, and sailed close past the supposed Thompson Island without seeing it, then across the site of Liverpool Island, then across the site of Lindsay Island, and then he found an island a little further west, answering Bouvet’s description, only that it was smaller. Bouvet Island was located—finally, let us hope—in $54^{\circ} 26'$ south latitude, $3^{\circ} 24'$ east longitude. Lindsay and Liverpool Islands are probably identical with Bouvet Island, and Thompson Island is perhaps non-existent. Bouvet Island is volcanic, covered with one vast glacier, and no trees were seen through the telescope.

The “Valdivia” then proceeded east and south. The edge of the pack was followed from 8° east longitude to 58° east longitude; the most southerly point reached was $64^{\circ} 15'$ south latitude, $54^{\circ} 20'$ east longitude, when the “Valdivia” was one hundred and two nautical miles from Enderby Land. At this point the enormous icebergs and the strong ice blink to the south proved proximity to land, and it is questionable whether some of the high ice peaks in the far distance did not belong to it. The “Valdivia” came north to Kerguelen Island at the end of December and then left the Antarctic.

The scientific results of the voyage are important. The icebergs seen between Bouvet Island and 40° east longitude were weather-beaten and carved into grotesque forms; suggesting that they had

already made a long voyage and, therefore, that no land exists between 0° and 40° east longitude, except perhaps in high polar latitudes. Between 40° and 62° east longitude, where the icebergs increased, tabular icebergs were found, and the farther east the ship went, the more such tabular bergs did it find. Some of them were to all appearance just broken off the land and showed no clefts. Some rocks, which had dropped from the melting icebergs, were collected in trawls: gneiss, granite, schist and red sandstone, but no volcanic rocks, showing that Enderby Land is not of volcanic origin. This is surprising on account of the soundings made by the "Valdivia." At Bouvet Island the soundings were 3080 meters, and going towards Enderby Land they were all over 4000 meters, many were over 5000 meters, and the deepest was 5733 meters. Between Enderby Land and Kerguelen Island the depth was not so great; starting with 4647 meters north of Enderby Land, a little further it was 4919 meters, the ocean shallowing to 2015 meters near Kerguelen Island. This shows that at least between 0° and 50° east longitude and south of 55° south latitude, there is a fairly regular and deep depression, with no suggestion of a plateau.

Mr. C. E. Borchgrevink³⁰⁷ led an expedition to

³⁰⁷ *The Geographical Journal*, London, Vol. XVI., pages 381-414:—Borchgrevink, C. E.: "The 'Southern Cross' expedition to the Antarctic."

East Antarctica in 1898-1900. He struck the ice in $51^{\circ} 56'$ south latitude, $153^{\circ} 53'$ east longitude, then finding the ice conditions unfavorable—which he thinks they always are in this locality—he went east and sighted the Balleny Islands on January 14th, 1899. He had trouble with the ice, and was forced northward and eastward. Finally the "Southern Cross" ran into open water and reached Cape Adare on February 17th.

At Cape Adare, Mr. Borchgrevink and the members of his party landed and the "Southern Cross" returned north. The expedition spent the winter at Cape Adare in Camp Ridley, making short journeys in the neighborhood and also scien-

Borchgrevink, C. E. : *First on the Antarctic Continent*, London, George Newnes, 1901. Mr. Borchgrevink has allowed an error to be made in the title of one of the charts of his book. It is called "Track of Sy 'Southern Cross' over Wilkes Land! by W. Colbeck, Sub-Lieut. R. N. R." The southward track of the "Southern Cross" is marked as between 161° and 162° east longitude, down to 66° south latitude, by 162° and a few minutes east longitude. The "Southern Cross" was at this point at least three degrees distant from the most easterly point of Wilkes Land proper and it then sailed eastward. The "Southern Cross," therefore, never approached Wilkes Land at any time and the title of the chart is consequently incorrect. The title of the book, however, *First on the Antarctic Continent*, is an acknowledgment that Victoria Land is a portion of the Antarctic Continent discovered and named by Charles Wilkes.

Bernacchi, Louis, F. R. G. S. : *To The South Polar Regions*, London, Hurst and Blackett, 1901. The "South Polar Chart" in this book is the same as the one published by Stanford in accordance with Sir C. R. Markham's extraordinary suggestion.

tific observations. Most of the rocks of the surrounding country are of volcanic origin, and represent basaltic lava flows which have taken place during late geological epochs. Six different kinds of lichen were found, including the ordinary reindeer moss: specimens were obtained as high as 900 meters. In the lichen three distinct types of insect were found: apparently the second discovery of the kind in Antarctica. In Robertson Bay there is also an abundance of fish, and about five different kinds were discovered. August was the coldest month, the mean temperature being -25.2° C. Many tremendous gales were experienced, the wind sometimes exceeding ninety miles an hour and proving a serious check to sledge expeditions: these gales always came from the same direction, east-southeast.

The "Southern Cross" returned to Cape Adare on January 28th, 1900. The expedition then went south, along the coast of Victoria Land. They made a landing in Southern Cross Firth at the foot of Mount Melbourne, and another at the foot of Mount Terror. From Mount Erebus a smoke cloud was occasionally shot up into the air. The "Southern Cross" then followed the ice barrier eastward until on February 17th it reached $78^{\circ} 34'$ south latitude, $164^{\circ} 10'$ west longitude, where a break was discovered in the barrier. Mr. Borchgrevink landed with Lieutenant Colbeck and the Finn Savio, and proceeded southward, reaching $78^{\circ} 50'$ south

latitude, the furthest south yet reached. The "Southern Cross" then returned north.

During the year 1901, three expeditions, an English, a German, and a Swedish, started for the Antarctic. A Scotch expedition, under Dr. W. S. Bruce, and an English relief vessel, the "Morning," are preparing to sail in 1902.

The English expedition sailed in the "Discovery" under the command of Commander Robert F. Scott, R. N., and arrived at Lyttleton, New Zealand, on November 28. On the way, the "Discovery" ran down to $63^{\circ} 5'$ south latitude, 141° east longitude, at which point pack ice was encountered and any attempt to penetrate farther was abandoned. The "Discovery" is thus the first ship to approach Wilkes Land since 1840. The expedition is to proceed to South Victoria Land, also examine the great ice barrier, and it may or may not, according to circumstances, winter in the Antarctic. The "Discovery" is expected to return in 1903.

The German expedition in the "Gauss," sailed under the command of Dr. Erich von Drygalski. It is to proceed to Kerguelen Island, where a magnetic and meteorological station is to be established. The journey to the south is then to be continued, the principal field of exploration being the Indo Atlantic side of the south polar region. Should land be discovered which can be reached, a tempo-

rary station is to be erected. It is intended the expedition shall return in 1903 or 1904.

The Swedish expedition under Dr. Otto Norden-skjold sailed in the "Antarctic" for the South Shetlands and King Oscar Land. An attempt will be made to ascertain whether West Antarctica is part of a continent or whether it consists of islands in the southern part. A winter station may be established somewhere on the east coast, and the ship return to the Falklands for the southern winter. The "Antarctic" is expected home in 1902 or 1903.

Let us wish these brave explorers all success.

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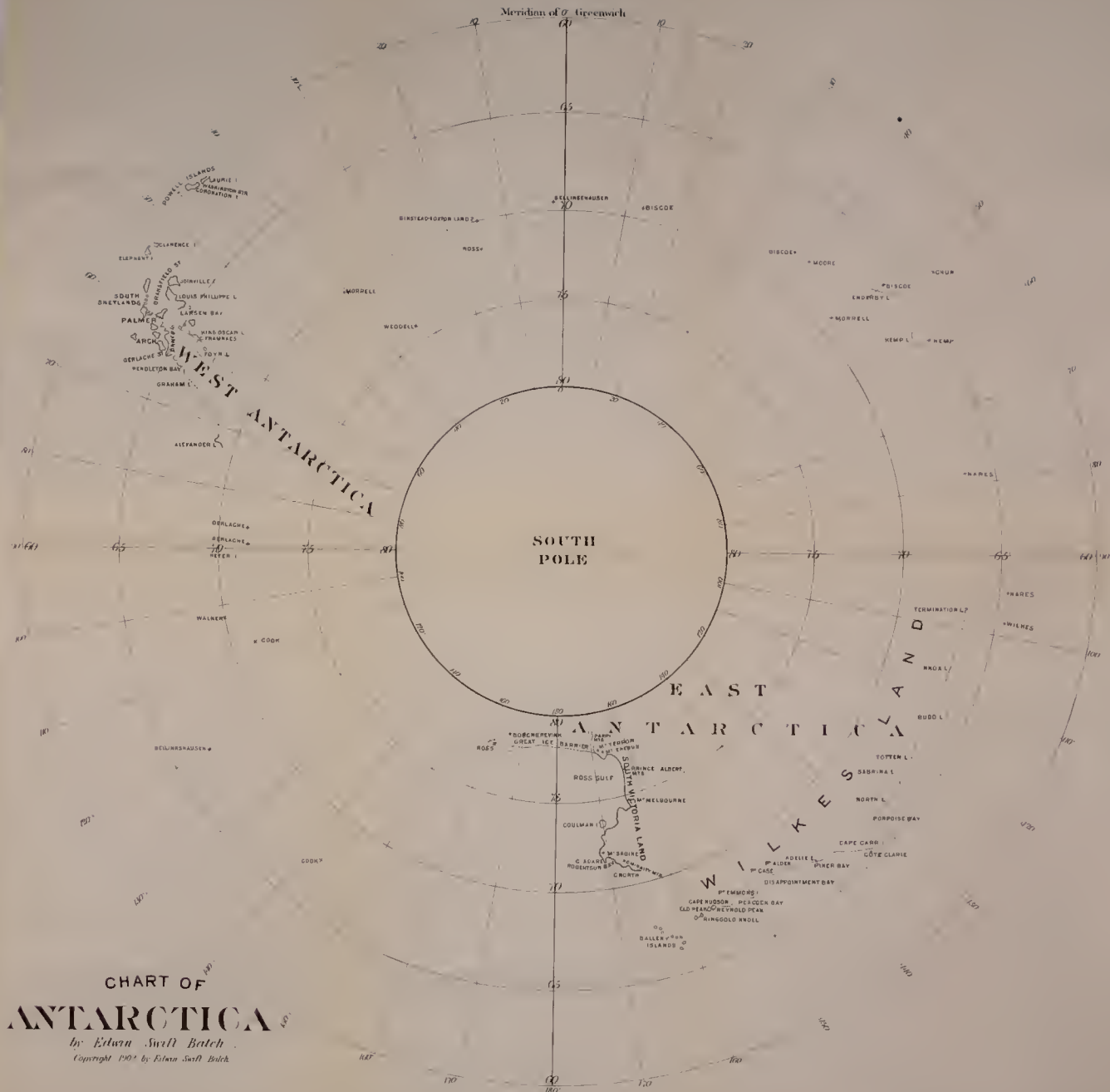


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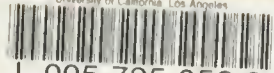
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