

# REPORT

OF THE

SELECT COMMITTEE ON POSTAL COMMUNICATION.

---

PRESENTED TO BOTH HOUSES OF THE GENERAL ASSEMBLY, BY COMMAND OF  
HIS EXCELLENCY.

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WELLINGTON.

—  
1869.



REPORT OF SELECT COMMITTEE ON POSTAL COMMUNICATION.

No. 1.

REPORT.

THE Select Committee appointed to inquire into and report upon the Steam Services which it may be desirable to subsidize, with a view of maintaining efficient postal communication between this Colony, the Australian Colonies, and Europe, beg leave to report as follows:—

The questions referred to your Committee appear to resolve themselves into two—

- 1st. The arrangement which it may be most desirable to adopt for the conveyance of the New Zealand-English Mails to and from Australia, and the probable cost of the same.
- 2nd. The advantages to be derived by this Colony from the establishment of a Mail Service *via* Torres Straits, or from the establishment of a Mail Service between New Zealand and San Francisco, and the relative cost of such services.

With regard to the first question, it appears to your Committee, after having taken all the evidence within their reach, and after a full consideration of the various arrangements under which these mails can be transmitted, that practically the choice to be made lies between a single Intercolonial Service, similar to the one at present in operation between Melbourne, Hokitika, and Wellington, but continued to Port Chalmers and the Bluff: and a double Intercolonial Service, having one steamer running between Sydney and Auckland, and the other between Melbourne, the Bluff, Port Chalmers, and Wellington. With a view of putting clearly before your honorable House the relative advantages of the two schemes, your Committee have prepared a Table, showing the dates upon which an English Mail would be delivered at the several ports in New Zealand if sent by the single service and the double service respectively.

TIME TABLE showing the DATES of ARRIVAL at the various Ports of NEW ZEALAND of an ENGLISH MAIL leaving Southampton on the 12th June, if sent by one Intercolonial Service, or if sent by two Services.

Ports.					One Service <i>via</i> Hokitika, Wellington, and Port Chalmers.				Two Services, one <i>via</i> the Bluff to Wellington, and one <i>via</i> Sydney and Auckland.			
Southampton	...	...	...	dep.	June	12	...	...	June	12		
Melbourne	...	...	...	arr.	August	5	...	...	August	5		
Sydney	...	...	...	arr.			...	...	"	8		
Auckland	...	...	...	arr.	"	17	...	...	"	14		
New Plymouth	...	...	...	arr.	"	16	...	...	"	16		
Nelson	...	...	...	arr.	"	14	...	...	"	17		
Picton	...	...	...	arr.	"	13	...	...	"	18		
Napier	...	...	...	arr.	"	14	...	...	"	17		
Wellington	...	...	...	arr.	"	13	...	...	"	16		
Lyttelton	...	...	...	arr.	"	15	...	...	"	14		
Port Chalmers	...	...	...	arr.	"	17	...	...	"	12		
Bluff	...	...	...	arr.	"	19	...	...	"	11		
Hokitika	...	...	...	arr.	"	11	...	...	"	19		

It will be seen that by the single service the mails would be delivered earlier than by the double services, by three days at Nelson, Napier, and Wellington, by five days at Picton, and by eight days at Hokitika and Greymouth; while by the double services they would be delivered earlier at Auckland by three days, at Port Chalmers by five days, at the Bluff by eight days, and at Lyttelton by one day. At New Plymouth the time of delivery would be the same in both cases. The value of an acceleration in the delivery of the English mails at the principal ports in New Zealand is, however, greatly lessened by the fact that in every instance the outgoing English mail will have been despatched a few days before the arrival of the inward mail. No practicable acceleration can, under the existing Time Table of the P. and O. Company's vessels, afford to New Zealand an opportunity of an early reply to English letters.

The relative cost of the two schemes would probably be as follows:—

REPORT OF THE SELECT COMMITTEE.

By one Intercolonial Service.

Melbourne, Hokitika, Wellington, and Bluff	£12,000
One Interprovincial service and a half	8,000
Wellington and Napier	650
	£20,650
Probable Imperial Contribution	6,000
Net cost	£14,650

Two Intercolonial Services.

Melbourne, Bluff, Wellington, and Hokitika	£12,000
Melbourne and Sydney	2,000
Sydney and Auckland	7,800
One Interprovincial service and a half	8,000
Wellington and Napier	650
	£30,450
Probable Imperial Contribution	6,000
Net cost	£24,450

Your Committee are of opinion that not less than two regular Mail Services per month should be kept up between the several ports of the Colony. Accordingly both of the above schemes provide for two complete Interprovincial Services, the southern half of one of them being, however, performed by the Intercolonial steamer.

Your Committee abstain from making any recommendations as to which of the two schemes should be adopted; the question appears to them mainly one of expense. The statements above given will enable your honorable House to form a reliable opinion as to the relative postal advantages of the two proposals, and as to their probable cost, as well as to determine whether the advantages presented by the double service are worth the additional outlay which it will involve.

With respect to the San Francisco and Torres Straits Mail Services, your Committee have taken evidence, and have collected the best information at their disposal; such information is, however, necessarily very imperfect. They append to this Report a valuable Memorandum by Lieutenant Woods, Marine Surveyor, on the Pacific line, as well as a Memorandum from the same officer on the peculiarities of the navigation between Brisbane and Singapore *via* Torres Straits.

For the purpose of illustrating the comparative utility for postal purposes of the two routes above mentioned, as well as of that now in use by way of Melbourne and King George's Sound, your Committee append a Time Table showing the dates at which mails sent on the same day from London by each of those routes would arrive at the several ports in New Zealand.

TABLE showing DATES OF ARRIVAL at the different Ports of NEW ZEALAND of a MAIL from LONDON *via* MELBOURNE and HOKITIKA, *via* SINGAPORE and AUCKLAND, and *via* SAN FRANCISCO and AUCKLAND, respectively.

Via MELBOURNE AND HOKITIKA.						Dates.		No. of Days in transit.
Ports.								
London <i>via</i> Marseilles	...	...	...	...	dep.	June	18	...†
Melbourne	...	...	...	...	arr.	August	5	48
Hokitika	...	...	...	...	arr.	"	11	54
Wellington	...	...	...	...	arr.	"	13	56
Lyttelton	...	...	...	...	arr.	"	14	57
Port Chalmers	...	...	...	...	arr.	"	15	58
Bluff	...	...	...	...	arr.	"	17	60
Picton	...	...	...	...	arr.	"	13	56
Nelson	...	...	...	...	arr.	"	14	57
Taranaki	...	...	...	...	arr.	"	16	59
Napier	...	...	...	...	arr.	"	14	57
Manukau	...	...	...	...	arr.	"	17	60

Via SINGAPORE AND AUCKLAND.						Dates.		No. of Days in transit.
London <i>via</i> Marseilles	...	...	...	...	dep.	June	18	...†
Singapore	...	...	...	...	arr.	July	23	35
Brisbane	...	...	...	...	arr.	August	9	52*
Auckland	...	...	...	...	arr.	"	19	62
Napier	...	...	...	...	arr.	"	22	65
Wellington	...	...	...	...	arr.	"	23	66
Lyttelton	...	...	...	...	arr.	"	25	68
Port Chalmers	...	...	...	...	arr.	"	26	69
Bluff	...	...	...	...	arr.	"	29	72
Picton	...	...	...	...	arr.	"	24	67
Nelson	...	...	...	...	arr.	"	25	68
Taranaki	...	...	...	...	arr.	"	27	70
Hokitika	...	...	...	...	arr.	"	29	72

\* The actual time occupied between London and Queensland in six experimental voyages made in 1866, was 66½ days. (*Vide* E.—No. 41868, page 19.)

† The time stated to be occupied *via* Singapore and King George's Sound is that taken by the Marseilles Mail; the bulk of the Mails are sent by Southampton, and take six days longer in their transmission.

# ON POSTAL COMMUNICATION.

5 F.—No. 5.

## Via SAN FRANCISCO AND AUCKLAND.

Ports.						Dates.		No. of Days in transit.
London	...	...	...	...	... dep.	June	12	...
New York	...	...	...	...	... arr.	"	22	10
San Francisco	...	...	...	...	... arr.	"	27	15
Auckland	...	...	...	...	... arr.	July	21	39
Taranaki	...	...	...	...	... arr.	"	23	41
Nelson	...	...	...	...	... arr.	"	24	42
Hokitika	...	...	...	...	... arr.	"	28	46
Pictou	...	...	...	...	... arr.	"	25	43
Napier	...	...	...	...	... arr.	"	27	45
Wellington	...	...	...	...	... arr.	"	26	44
Lyttelton	...	...	...	...	... arr.	"	28	46
Port Chalmers	...	...	...	...	... arr.	"	29	47
Bluff	...	...	...	...	... arr.	"	31	49

The dates of the Melbourne and Hokitika route are given as they are now fixed; the dates of the Singapore and Auckland route are based on the P. and O. Company's Time Table, and the Tables prepared for the Melbourne Conference; and the dates of the San Francisco and Auckland route are based on the information given by Lieutenant Woods with regard to the Pacific Service and the ascertained time taken by the Atlantic Steamers for the performance of their voyage.

It will be seen that the San Francisco line is, for postal purposes, beyond comparison the best of the three. It would afford a delivery of English letters in Auckland twenty-one days sooner than the route *via* King George's Sound, and twenty-three days sooner than that *via* Torres Straits, even when forwarded *via* Marseilles.

It is difficult at present to form any accurate estimate of the relative commercial advantages of the two services. That by way of Brisbane and Torres Straits would afford regular and easy access to Queensland and the Eastern Archipelago, with the latter of which New Zealand now communicates by way of King George's Sound and Ceylon. The San Francisco route, on the other hand, would bring New Zealand into immediate communication with the populous and important state of California, and, by means of the Pacific Railroad, with the whole of the North American Continent. The only regular communication now existing between North America and New Zealand is through the United Kingdom.

As to the probable cost of these services, your Committee have not been able to obtain any precise data. It has, as your Committee is informed, been stated by Mr. Tooth that the Torres Straits' Service could be carried out at a cost to New Zealand and Queensland of very little more than £1,200 per month each. Your Committee are not aware upon what authority this estimate has been formed; should it be correct, the total charge to be borne by New Zealand would not exceed £14,400 per annum. The total contribution of New Zealand to the Peninsular and Oriental Company's subsidy would probably remain as at present, because the additional payment to be made for conveying New Zealand letters between Galle and Singapore would be about balanced by the diminution in the charge for New Zealand Mails between Galle and Melbourne. This subsidy for the present year may be estimated at about £26,000, in addition to the cost of the Mail Service between Australia and New Zealand.

Your Committee cannot pretend to say what the cost of a Mail Service between this Colony and San Francisco would be. They desire to point out, however, that in the event of its establishment, the greater part of the subsidy now paid by New Zealand for the Peninsular and Oriental Company's Services, would be saved, as well as the cost of the Intercolonial Mail Service, which it would not then be worth while to keep up for the sake of the small amount of correspondence which would continue to be sent by the comparatively tardy and circuitous route *via* Galle. There can be little doubt that the Colony of New South Wales (if not Victoria) would contribute to the support of a Postal Service which would be a much more expeditious one than that by which she is now supplied with her English Mails. Some contribution would also be received from Tahiti, which would lie in the direct route of the steamers to San Francisco.

Provision already exists in a Postal Convention (of which a copy is attached to this Report) between Great Britain and the United States, for the transmission of British Mails through the United States at a very low rate of transit postage; and the British Post Office, even if it could not be induced to furnish any contribution to the cost of the Pacific Service, would probably be willing to afford, as it did in the case of the Mails *via* Panama, free transit by the Atlantic Mail Steamers for the New Zealand Mails. The above facts appear to your Committee to furnish good grounds for the conclusion that the net cost to New Zealand of a Mail Service *via* San Francisco, after making allowance for probable contributions from the Australian Colonies, would not much exceed the saving which would be effected through the comparative disuse by this Colony of the existing services *via* Melbourne and Galle.

Under the above circumstances, your Committee cannot recommend that any contribution should be made by New Zealand to the cost of a Postal Service *via* Torres Straits; but they suggest that the Government should be requested to institute inquiries with the view of ascertaining the expense at which, and the conditions on which, a Mail Service *via* San Francisco could be established; and also to what extent those Australian Colonies which would be benefited by such a Service would be prepared to contribute to its cost.

By order of the Committee,  
JOHN HALL, Chairman.

REPORT OF THE SELECT COMMITTEE

No. 2.

MEMORANDA ON OCEAN POSTAL ROUTE between BRISBANE and SINGAPORE, *via* TORRES STRAITS.

Wellington, 28th June, 1869.

As the Dutch Government maintain a steam postal communication between Singapore and Sourabaya, *via* Batavia, twice a month, they would doubtless facilitate the postal communication between Brisbane and Singapore by means of their Batavian packets.

On the supposition that no difficulties would occur to prevent an arrangement of this nature being carried out, the course and distance of the English Mail Steamers would be limited to the navigation of the region between Brisbane and Sourabaya, the intricacies of which passage are now rendered less dangerous owing to the surveys undertaken, and the reliable charts that have been issued from the Hydrographic Office. The survey of the inner route from Moreton Bay to Cape York is an admirable one, and leaves nothing to be desired so far as the channel is concerned.

The general route that would be followed is that of the Inner Torres Straits passage, calling at Port Curtis and Port Denison, then entering the Barrier between Palm Islands and Halifax Bay, when it is comparatively a straight course to the parallel of the Lizard Island. From this position to the western side of Prince of Wales Islands we find the most intricate navigation: it is undeniably dangerous, and requires the greatest vigilance until through the Prince of Wales Channel. The course from this to Koepang being across the Arafura Sea almost in a straight line, is free from dangers. From Koepang they would steer north of the Island of Sumba to Allas Straits, and thence a direct course to Sourabaya. The distances to be run would then be as follows:—

English Steamers—Cape Moreton to Port Curtis	...	...	300 miles.
Port Curtis to Port Denison	...	...	270 "
Port Denison to Cape York	...	...	690 "
Cape York to Koepang	...	...	1,140 "
Koepang through Allas Straits	...	...	470 "
Allas Straits to Sourabaya	...	...	220 "
			<hr/>
			3,090 "
Dutch Steamers—Sourabaya to Batavia	...	...	340 "
Batavia to Singapore	...	...	480 "
			<hr/>
			3,910 "

Coaling-stations would be required at Cape York and Koepang, for which a day's detention should be allowed; also a day's detention at Batavia, and eight hours at Sourabaya, as the transhipment from the English to the Dutch steamer will not take beyond that time.

Now, taking all the intricacies and dangers of the passage into consideration, I am of opinion that the steamers employed would not average more than nine miles per hour, consequently it would take fairly twenty-two days to deliver the mail at Singapore from Brisbane under favourable circumstances, always supposing the steamers to be of adequate power, and capable of carrying coal sufficient for steaming purposes. Such vessels as the "Rangitoto" and "Tararua" are, I think, in every way adapted for this service.

I have already remarked upon the intricacies in the navigation of Torres Straits seas, and the valuable surveys that have been carried out recently, but it must not be supposed for an instant that a great deal more work of the same nature is not required before this route can be used with perfect safety by ocean mail steamers. Moreover, mail steamers must continue their course both night and day to be of any service, and this I hold to be almost impossible until the Straits are lighted up, and a pilot service established between Booby Island and Lizard Island; and for day navigation, a system of beacons must be constructed, throughout the whole length of the route in Torres Straits, on various coral patches that are awash, and are lying immediately in the track of steamers passing through. These are much required at certain seasons of the year, when the sun has North declination, as vessels at that time proceeding to the North and West have the sun immediately in the front of them during the afternoons and evenings, consequently the shoal patches are not discernable.

My object in recommending Sourabaya as the terminus of the English line of packets, is on account of the really good harbour that exists there, and the facilities offered to vessels for docking, refitting, and repairs, &c. A large Government steam factory is in full working order, with all the necessary lathes and steam hammers for doing any description of repairs to steamers, &c. The dock is capable of taking in vessels of a much larger class than those proposed to be used on this route. Private factories also exist, and a splendid road runs the whole distance of the Island of Java from the Port of Sourabaya to Batavia.

It is very questionable whether this postal route would be of any service to the Colony of New Zealand, seeing that letters from England to the nearest port of New Zealand could not be delivered under seventy-two days, as under:—

England to Singapore	...	...	...	...	41 days.
Singapore to Brisbane	...	...	...	...	22 "
Brisbane to Auckland, <i>via</i> Sydney	...	...	...	...	9 "
					<hr/>
					72 "

And it would be worth the consideration of the Queensland Government, before accepting any tenders for a Torres Straits and Singapore Postal Service, to discuss the propriety of subsidizing a Company which would undertake the conveyance of the mails from England *via* San Francisco and New Zealand, as by that route the community in that Colony would obtain their letters from England, under ordinary circumstances, in fifty-one days, as against sixty-three days *via* Torres Straits. I append a track chart of the proposed route from Brisbane to Singapore.

G. A. Woods, Colonial Marine Surveyor.

## No. 3.

MEMORANDUM for the Honorable the POSTMASTER-GENERAL.

San Francisco and Japan Line of Steamers.

"GREAT REPUBLIC" and others run between San Francisco, Kanagan Islands, Japan, and Hong Kong. They are vessels of 4,500 tons; their length is about 360 feet, and beam 50 feet, with 31 feet 6 inches depth of hold. Engines are beam construction, with 105 inch cylinder, and 12 feet stroke of piston—fitted with surface condensers. The propelling power by paddle, and average rate of steaming, twelve knots.

The round voyage from San Francisco until returning to the same port occupies sixty-two days.  
27th January, 1869. G. A. WOODS, M.S.

## No. 4.

POSTAL CONVENTION between GREAT BRITAIN and the UNITED STATES of AMERICA.

THE General Post Office of the United Kingdom of Great Britain and Ireland and the General Post Office of the United States of America being desirous of regulating, by means of a new Convention, the Communications by Post between the two countries, the undersigned, duly authorized for that purpose by their respective Governments, have agreed upon the following Articles:—

*Article 1.*—There shall be an exchange of correspondence between the United Kingdom of Great Britain and Ireland and the United States of America, as well for letters, newspapers, book packets, and patterns or samples of merchandize, originating in the United Kingdom or in the United States, as for articles of the same nature originating in or destined for the countries or colonies the correspondence of which is forwarded through the United Kingdom or through the United States.

*Article 2.*—Each office shall make its own arrangements for the despatch of mails to the other office by well appointed ships sailing on stated days, and shall, at its own cost, remunerate the owners of such ships for the conveyance of the mails.

*Article 3.*—The postage on a single international letter shall not exceed sixpence in the United Kingdom, or twelve cents in the United States, and the authorized weight of a single letter shall be half-an-ounce in the United Kingdom, or fifteen grammes (by the metrical scale) in the United States.

For other than single letters the same charge shall be made for every additional half-ounce or fifteen grammes, or fraction thereof.

*Article 4.*—Every international letter insufficiently paid, or wholly unpaid, received in the United States from the United Kingdom shall, in addition to the deficient postage, be subject to a fine of five cents, such fine to be retained by the United States Post Office; and every international letter insufficiently paid, or wholly unpaid, received in the United Kingdom from the United States, shall, in addition to the deficient postage, be subject to a fine the amount of which shall be fixed and retained by the British Post Office.

*Article 5.*—International newspapers, book packets (including printed papers of all kinds, maps, plans, prints, engravings, drawings, photographs, lithographs, sheets of music, and so forth), and patterns and samples of merchandize (including seeds and grain), shall be transmissible by either office at such charges (not less than threepence in the United Kingdom, or six cents in the United States per four ounces on book packets and patterns or samples of merchandize), and under such regulations, as the despatching office may from time to time lay down.

These regulations, however, shall include the following:—

1. The postage shall be fully prepaid.
2. No book packet may contain anything which is sealed or otherwise closed against inspection, nor must there be any letter, nor any communication of the nature of a letter, whether separate or otherwise, unless the whole of such letter or communication be printed; but entries merely stating from whom, or to whom, the packet is sent, shall not be regarded as a letter.
3. No book packet must exceed two feet in length, or one foot in width or depth.
4. Neither office shall be bound to deliver printed papers the importation of which may be prohibited by the laws or regulations of the country to which they are transmitted.
5. So long as any Customs duty is chargeable in the United States on the importation, from the United Kingdom, of any of the articles enumerated above, such Customs duty shall be leviable in the United States, and the proceeds shall accrue to the United States Treasury.
6. Except as above, no charge whatever shall be levied in the country in which international newspapers, book packets, and patterns or samples of merchandize are delivered.

*Article 6.*—The postage collected in the two countries on international letters, newspapers, book packets, and patterns or samples of merchandize, together with the fees for registration (but exclusive of fines for unpaid or insufficiently paid letters), shall be equally divided between the two offices.

That portion of the postage of transit letters, transit newspapers, book packets, and patterns or samples of merchandize, which represents the charge for the sea conveyance between the United Kingdom and the United States, shall belong wholly to the despatching office.

For the purposes of this Article, the charge for the sea conveyance of letters across the Atlantic shall be computed on the basis of fourpence, or eight cents, per single letter rate, and the charge for the sea conveyance across the Atlantic of newspapers, book packets, and patterns or samples of merchandize, shall be computed at threepence per pound, or twelve cents per kilogramme.

*Article 7.*—The United States Post Office may deliver to the British Post Office letters or other postal packets which have been registered addressed to the United Kingdom. Reciprocally, the British Post Office may deliver to the United States Post Office registered letters or other postal packets which have been registered addressed to the United States.

The postage of registered letters and so forth shall always be paid in advance.

## REPORT OF THE SELECT COMMITTEE

In addition to this postage, there shall also be charged a registration fee, the amount of which shall be fixed by the despatching office.

*Article 8.*—The United States Post Office may further deliver to the British Post Office registered letters and so forth, addressed to those countries or colonies to which registered letters can be sent from the United Kingdom.

The United States Post Office shall account to the British Post Office (in addition to the postage due to the British Post Office) for such sum as shall be chargeable to the inhabitants of the United Kingdom for the registration from the United Kingdom of every registered letter and so forth addressed to the countries or colonies above mentioned.

On its side, the British Post Office may deliver to the United States Post Office registered letters and so forth addressed to those countries to which registered letters can be sent from the United States.

The British Post Office shall account to the United States Post Office (in addition to the postage due to the United States Post Office) for such sum as shall be chargeable to the inhabitants of the United States for the registration, from the United States, of every registered letter and so forth addressed to the countries above mentioned.

*Article 9.*—The British Post Office engages to grant the transit through the United Kingdom, as well as the conveyance, by British Mail Packets, of the closed mails which the United States Post Office may exchange, in either direction, with the Post Offices of United States Possessions or of Foreign Countries, and the United States Post Office engages to grant the transit through the United States, as well as the conveyance by United States Mail Packets, of the closed mails which the British Post Office may exchange, in either direction, with the Post Offices of British Possessions or of Foreign Countries.

The country which sends or receives closed mails through the other shall render an account of the letters, newspapers, book packets, and patterns contained in such closed mails.

*Article 10.*—The rates of postage to be mutually paid for the territorial transit (including the passage of the English Channel) of all letters sent from one country to the other for transmission to places beyond, in closed mails, shall be one-half the ordinary inland rates now charged in the two countries respectively; viz., for transit through the United States one-half of three cents per single letter, and for transit through the United Kingdom one-half of a penny per single letter.

The transit rates of postage to be mutually paid for newspapers, book packets, and patterns, or samples of merchandize sent in closed mails, shall be fourpence per kilogramme for transit through the United Kingdom, and six cents per pound for transit through the United States.

*Article 11.*—When, in any British or United States Port, a closed mail is transferred from one ship to another without any expense devolving on the office of the country owning such port, such transfer shall not be deemed a territorial transit, and shall not give rise to any charge for territorial transit.

*Article 12.*—The rates of postage to be paid by the British Post Office to the United States Post Office for the sea conveyance, other than across the Atlantic, of correspondence sent from the United Kingdom to the United States, in closed mails, for transmission to places beyond, or brought to the United States from places beyond, in closed mails, for transmission to the United Kingdom, shall be the same that are paid by the inhabitants of the United States. Reciprocally the rates of postage to be paid by the United States Post Office to the British Post Office for the sea conveyance, other than across the Atlantic, of correspondence sent from the United States to the United Kingdom, in closed mails, for transmission to places beyond, or brought to the United Kingdom from places beyond, in closed mails, for transmission to the United States, shall be the same that are paid by the inhabitants of the United Kingdom.

*Article 13.*—The combined territorial and sea rates upon transit correspondence sent in ordinary mails, to be accounted for by one office to the other, shall be the same that are paid by the inhabitants of the country through which the correspondence is forwarded.

*Article 14.*—The amount of postage chargeable by the United States Post Office, on its own account, upon every single letter sent through the United Kingdom in ordinary mails addressed to the United States, shall be three cents, and the amount of postage chargeable by the British Post Office, on its own account, upon every single letter sent through the United States in ordinary mails addressed to the United Kingdom, shall be one penny.

*Article 15.*—There shall be an exchange of correspondence between the United States of America and Bermuda, and between those States and the British Post Office agencies established in the Danish Colony of St. Thomas, in Panama, in Colon, and in San Juan (Porto Rico). The postage to be accounted for on such correspondence shall be fixed from time to time by the mutual consent of the two offices.

*Article 16.*—The British Post Office shall prepare, at the expiration of every quarter, separate accounts exhibiting the results of the exchange of correspondence, whether in ordinary mails, or in closed mails, between the respective offices.

Such accounts shall be founded upon the acknowledgments of receipt of the respective offices during the quarter.

The separate accounts shall be incorporated in general accounts which shall be compared and settled by the two offices, and the balance shall forthwith be paid in the money of the country to which the payment is to be made by that office which is found to be indebted to the other.

In converting United States currency into sterling or sterling into United States currency, four shillings and twopence shall be considered as the equivalent of a dollar.

*Article 17.*—Official communications addressed by the United States Post Office to the British Post Office, or by the British Post Office to the United States Post Office, shall not give rise to any account between the two Post Offices.

*Article 18.*—The two offices shall by mutual consent make detailed regulations in accordance with the foregoing articles, such regulations to be terminable, on a reasonable notice, by either office.



*Article 19.*—All the conventions which now regulate the exchange of correspondence between the United Kingdom of Great Britain and Ireland and the United States of America, shall cease to have effect from the date of the day when the present Convention shall be put into execution.

*Article 20.*—Articles 1, 5, 7, 8, 9, 10, 11, 12, 15, 16, 17, and 18 shall come into operation on the 1st October next, and the remaining articles on the 1st day of January, 1868.

*Article 21.*—This Convention shall be terminable at any time, on a notice by either office of one year, and article 5, except so far as relates to newspapers, shall be terminable on a notice of three months.

Done in duplicate and signed in London the 18th day of June, 1867.

MONTROSE.

JOHN A. KASSON,  
Sp. Commr., &c., &c.

### No. 5.

#### MEMORANDUM by the COLONIAL MARINE SURVEYOR.

In pursuance of instructions, the Colonial Marine Surveyor begs herewith to forward, for the information of the Hon. the Postmaster-General, the detail work of the following oceanic distances on Great Circles of the Sphere, and measured local distances:—

1. From Sydney to San Francisco direct.
2. " " " *via* Tahiti Island.
3. " " " *via* Wellington.
4. " " " " and Tahiti.
5. " " " *via* Auckland.
6. " " " " "
7. Melbourne to Wellington direct.
8. " " *via* Bluff Harbour, Port Chalmers, and Lyttelton.
9. " " Bluff Harbour direct.
10. " " *via* Wellington, Lyttelton, and Port Chalmers,

together with a Report and the comparative advantages of each ocean route in respect of winds and currents, and a chart with the great Circle Courses protracted from the data worked.

Marine Survey Office, Wellington,  
28th January, 1869.

G. A. WOODS,  
Colonial Marine Surveyor.

#### REPORT of ROUTES across the PACIFIC from S.W. to N.E.

THE observations of scientific officers of the American, French, and English services on the Equatorial Pacific Trade Winds have assured us that the S.E. trade wind only blows over that portion of the Pacific lying between the meridians of 90° and 140° W. longitude, and that the N.E. trade, commencing at about 300 miles from the West Coast of America, extends to the meridian of the Ladrone Islands. Much difference of opinion has, however, existed upon the question of the proper route to be taken by masters of vessels navigating these seas, and my own limited experience has led me to the belief in the advisability of pushing as much as possible to the eastward, when south of the Equator, in making a passage from the S.W. to the N.E. seaboard of this ocean, for, as a general rule, you seldom meet with unfavourable weather, and you carry with you a fair westerly and S.W. wind and current, between the parallels of 15° and 30° S., leading you into the S.E. trade in the 140° W. meridian. This trade will carry you to the N.E. with a beam wind across the Equator, and with the advantage of being set to windward by the equatorial counter-current, and consequently the N.E. trade, when fallen in with, is more of a leading than a head wind to its Polar limit of about 25° N.

Now, in making the westerly passage across the Equator to the northward, we find that unless you keep to the southward of the 10th parallel of north latitude (which would necessitate steaming over nearly 40° of longitude in the torrid zone), you would have to steam against the N.E. trade over at least 1,500 miles of latitude alone to the Polar limits of that trade wind. Of course this limit is subject to very considerable variation, according as the sun has N. or S. declination; but another great objection exists to the westerly passage, in the uncertain movements of the equatorial currents in the neighbourhood of the islands, by which they are much affected. The trade winds are also affected in a similar manner, and storms and hurricanes of considerable violence are occasionally met with in consequence. Assuming, then, that the eastern passage is the proper one to make, we find then, of the routes proposed, that *via* Tahiti most nearly approaches this course, and although the course on the great circle carries you again to the N.W. after crossing the Equator, I should be inclined to recommend a deviation to the eastward of the Marquesas after passing Tahiti, as by that means you secure a fair S.E. trade to its equatorial limit N. of the Equator, almost running you into the N.E. trade, which gives you then a leading wind to its Polar limit, when you will fall in with the prevailing N.W. and westerly wind of the North-west Coast of America, which will then serve as leading winds, steaming on the port tack towards San Francisco; but this deviation does not in any way affect the main question as to the choice of routes, and of the advisability of making Tahiti the coaling station. Now, assuming Sydney to be the port of departure, on reference to the tabulated distances, it will be observed that, supposing Auckland was made the port of call for New Zealand, the distance to San Francisco *via* Auckland is 6,945½ miles, while the distance *via* Auckland and Tahiti is 7,140 miles, being an increase of distance of 195 miles, or eighteen hours' steaming. Again, supposing Wellington to be the port of call for New Zealand, the distance to San Francisco *via* Wellington is 7,083 miles, and *via* Wellington and Tahiti 7,190 miles, being an increase of distance of only 107 miles, or about nine hours steaming; and with respect to the total distance, the route *via* Wellington and Tahiti has only a small increase of fifty miles over that *via* Auckland and Tahiti; but by making Wellington the port of call, the steamers would gain all the advantages of the prevailing westerly winds so far south of the Equator

REPORT OF THE SELECT COMMITTEE

to carry the steamers into that part of the Pacific Ocean where the trade winds are regularly established throughout the year.

With reference to the saving of distance which would result from making the Bay of Islands the port of call instead of Auckland, I estimate it to be about 120 miles.

Assuming Melbourne to be the port of arrival and departure, the port of call for New Zealand would naturally be Wellington, and the total distance to San Francisco from Melbourne would be 7,480 miles, being an increase of 290 miles over the route to Sydney *via* Wellington.

After carefully considering the question generally from a nautical point of view, I am of opinion that the most advantageous route for an Ocean Postal Service to San Francisco, for the benefit of the Australian Colonies and New Zealand, would be with Sydney as the port of arrival and departure (until there are facilities in Wellington for the docking accommodation of large ships), the vessels calling at Wellington and Tahiti *en route*, and I calculate that the voyage would be easily accomplished—with vessels of 2,500 tons, from Sydney to Wellington, 4 days; Wellington to Tahiti, 8 days; and Tahiti to San Francisco, 13 days; total, 25 days. Add to this, stoppages of 2 days, and the time occupied in going from San Francisco to New York, 6 days, and by Cunard's line, from New York to Liverpool, 10 days, we place Sydney within 43 days' postal communication with England, and Wellington within 38 days.

G. A. Woods,  
Colonial Marine Surveyor.

ON GREAT CIRCLE FOR DISTANCE.—SYDNEY TO SAN FRANCISCO.

Sydney ... Lat. 33° 51' 42" S., Long. 151° 14' E.  
San Francisco, Lat. 37° 48' 30" N., Long. 122° 24' W.

Lat. 33° 52' = 123° 52' Co. Lat. + 37° 48' = 52° 12' Co. Lat.  
Long. 151° 14' E. to Long. 122° 24' W. =  $\frac{1}{2}$  diff. Long. 43° 11'.  
 $\frac{1}{2}$  diff. Long. 43° 11' = Sin. 9·8352688

Sin. <sup>2</sup> ...	...	19·6705376
Co. Lat. Sin.	...	9·9192542
Co. Lat. Sin.	...	9·8977123
<hr/>		
2)39·4875041		
	19·7437520 ...	19·7437520
$\frac{1}{2}$ diff. Co. Lat. Sin.	9·7674746	
<hr/>		
43° 26' 09" Tang.	9·9762774 ... Sin.	9·8372991
<hr/>		
	53° 43' 41" ... Sin.	9·9064529
Distance, 6,447 miles	= 107° 27' 22"	

GREAT CIRCLE FOR COURSE.—SYDNEY TO SAN FRANCISCO.  
(See Diagram No. 1.)

107° 27' 22" ...	9·9795243				
	0·0204757 ...	...	...	...	0·0204757
86° 22' ...	9·9991262 ...	...	...	...	9·9991262
52° 12' ...	9·8977123		123° 52' ...		9·9192542
<hr/>					
N. 55° 45' E. ...	9·9173142	S. 60° 18' W. ...	9·9388561		
Course from		Course from			
Sydney to San Francisco.		San Francisco to Sydney.			
<hr/>					
Lat. 33° 52' Sin.	... 9·7460	37° 48' ...	9·7874		
55° 45' Tang.	... 10·1669	60° 18' ...	0·2438		
<hr/>					
Diff. Long.	39° 18' Tang.	... 9·9129	47° 04' ...	10·0312	
Long. Sydney	151° 14' E.		122° 24'		
<hr/>					
190° 32' — 360° =	169° 28' W.		169° 28' W.		
<hr/>					
Long. of point where the great Circle cuts the Equator.					
Sin. of course ... 9·9388561					
Sin. of Lat. ... 9·8977123					
<hr/>					
From Equator to either place, 43° 21' ... 9·8365684 Course.					

## ON GREAT CIRCLE FOR DISTANCE.—SYDNEY TO THREE KINGS.

Sydney ... Lat.  $33^{\circ} 52'$  S., Long.  $151^{\circ} 14'$  E.  
 Three Kings, Lat.  $34^{\circ} 06'$  S., Long.  $172^{\circ} 10'$  E.

Lat.  $33^{\circ} 52' =$  Co. Lat.  $56^{\circ} 08'$  and Lat.  $34^{\circ} 06' =$  Co. Lat.  $55^{\circ} 54'$ .  
 Long.  $151^{\circ} 14'$  E. to Long.  $172^{\circ} 10' = \frac{1}{2}$  diff. Long.  $10^{\circ} 28'$ .

$\frac{1}{2}$  diff. Long. Sin. ... 9.2592676

Sin.<sup>2</sup> ... 18.5185352

Co. Lat. Sin. ... 9.9192542

Co. Lat. Sin. ... 9.9180620

38.3558514

$\frac{1}{2}$  diff. Co. Lat. Sin. ... 19.1779257 ... 19.1779257

7.3088239

$89^{\circ} 13' 32''$  Tang. ... 11.8691018 ... Sin. 9.9999603

$8^{\circ} 39' 52''$  ... 9.1779654

Distance, 1,039.75 miles =  $17^{\circ} 19' 44''$

## GREAT CIRCLE FOR COURSE.—SYDNEY TO THREE KINGS.

(See Diagram No. 2.)

$17^{\circ} 20'$  ... 9.4741146

0.5258854 ... 0.5258854

$20^{\circ} 56'$  ... 9.5530105 ... 9.5530105

$55^{\circ} 54'$  ... 9.9180620 ... 9.9191694

S.  $83^{\circ} 13'$  E. ... 9.9969579 N.  $84^{\circ} 36'$  W. ... 9.9980653

Course from Course from  
 Sydney to Three Kings. Three Kings to Sydney.

## ON GREAT CIRCLE FOR DISTANCE.—SYDNEY TO WELLINGTON.

Wellington, Lat.  $41^{\circ} 17'$  S., Long.  $174^{\circ} 47'$  E.  
 Sydney ... Lat.  $33^{\circ} 52'$  S., Long.  $151^{\circ} 14'$  E.

Lat.  $33^{\circ} 52' =$  Co. Lat.  $56^{\circ} 8'$  and Lat.  $41^{\circ} 17' =$  Co. Lat.  $48^{\circ} 43'$ .  
 Long.  $151^{\circ} 14'$  E. to Long.  $174^{\circ} 47'$  E. =  $\frac{1}{2}$  diff. Long.  $11^{\circ} 46' 30''$ .

$\frac{1}{2}$  diff. Long. Sin. ... 9.3097769

Sin.<sup>2</sup> ... 18.6195538

Co. Lat. Sin. ... 9.9192542

Co. Lat. Sin. ... 9.8759036

2)38.4147116

19.2073558 ... 19.2073558

$\frac{1}{2}$  diff. Co. Lat. Sin. ... 8.8107529

$68^{\circ} 8' 16''$  Tang. ... 10.3966029 ... Sin. 9.9675863

$10^{\circ} 0' 8''$  ... 9.2397695

Distance, 1,200 miles =  $20^{\circ} 0' 16''$

## GREAT CIRCLE FOR COURSE.—SYDNEY TO WELLINGTON.

(See Diagram No. 3.)

$20^{\circ}$  ... 9.5340517

0.4659483 ... 0.4659483

$23^{\circ} 33'$  ... 9.6015703 ... 9.6015703

$48^{\circ} 43'$  ... 9.8759036  $56^{\circ} 8'$  ... 9.9192542

S.  $61^{\circ} 23'$  E. ... 9.9434222  $75^{\circ} 56'$  ... 9.9867728

S.  $104^{\circ} 4'$  W.

Course from Course from  
 Sydney to Wellington. Wellington to Sydney.

REPORT OF THE SELECT COMMITTEE

ON GREAT CIRCLE FOR DISTANCE.—SYDNEY TO TAHITI ISLANDS.

Sydney ... Lat. 33° 52' S., Long. 151° 14' E.  
Tahiti Islands, Lat 17° 29' S., Long. 149° 29' W.

Lat. 33° 52' = Co. Lat. 56° 08' and Lat. 17° 29' = Co. Lat. 72° 31'.  
Long. 151° 14' E. to Long. 149° 29' W. =  $\frac{1}{2}$  diff. Long. 29° 38' 30".  
 $\frac{1}{2}$  diff. Long. 29° 38' 30" ... Sin. 9.6942313

Sin. <sup>2</sup> ...	...	19.3884626	
Co. Lat. Sin. ...	...	9.9794593	
Co. Lat. Sin. ...	...	9.9192542	
		2)39.2871762	
		19.6435880	... 19.6435880
$\frac{1}{2}$ diff. of Co. Lat. Sin. ...	...	9.1537691	
72° 3' 42" Tang. ...	...	10.4898189	... Sin. 9.9783579
		27° 33' 24" ...	... 9.6652301
Distance, 3,307 miles	=	55° 6' 48"	

GREAT CIRCLE FOR COURSE.—SYDNEY TO TAHITI.

(See Diagram No. 4.)

55° 6' 48" ...	9.91398		
	0.08602	...	0.08603
59° 17' ...	9.93435	...	9.93435
72° 31' ...	9.97946	...	9.91925
S. 88° 28' E. ...	9.99983	S. 60° 29' W. ...	9.93963
Course from Sydney to Tahiti.		Course from Tahiti to Sydney.	

ON GREAT CIRCLE FOR DISTANCE.—AUCKLAND TO SAN FRANCISCO.

Auckland ... Lat. 36° 50' S., Long. 174° 49' E.  
San Francisco, Lat. 37° 48' N., Long. 122° 24' W.

Lat. 36° 50' = Co. Lat. 126° 50' and Lat. 37° 48' = 52° 12' Co. Lat.  
Long. 174° 49' E. to Long. 122° 24' W. =  $\frac{1}{2}$  diff. Long. 31° 23' 30".  
 $\frac{1}{2}$  diff. Long. Sin. ... 9.7167423

Sin. <sup>2</sup> ...	...	19.4334846	
Co. Lat. Sin. ...	...	9.9032977	
Co. Lat. Sin. ...	...	9.8977123	
		2)39.2344946	
		19.6172473	... 19.6172473
$\frac{1}{2}$ diff. Co. Lat. Sin. ...	...	9.7826301	
Tang. ...	...	9.8346172	... Sin. 9.7514167
		47° 14' 31" ...	... 9.8658306
Distance, 5,669 miles	=	94° 29' 2"	

GREAT CIRCLE FOR COURSE.—AUCKLAND TO SAN FRANCISCO.

(See Diagram No. 5.)

94° 29' ...	0.0013309	...	0.0013309
62° 47' ...	9.9490402	...	9.9490402
52° 12' ...	9.8977123	...	126° 50' ... 9.9032977
N. 44° 49' E. ...	9.8480834	S. 45° 33' W. ...	9.8536688
Course from Auckland to San Francisco.		Course from San Francisco to Auckland.	

# ON POSTAL COMMUNICATION.

13 E.—No. 5.

Lat. 36° 50' ...	9·7778	37° 48' ...	9·7874
Tang. 44° 49' ...	9·9972	45° 33' ...	0·0083
Diff. Long. 30° 47' ...	9·7750	32° 00' ...	9·7957
Long. 174° 49'		122° 24'	

$$205^{\circ} 36' = 360^{\circ} = 154^{\circ} 24' \text{ W.} \quad 154^{\circ} 24' \text{ W.}$$

Long. of point where great Circle cuts the Equator.

Sin. of Course 134° 27' ...	9·8536442
52° 12' ...	9·8977123

Bearing from Equator to either place, 34° 20' = 9·7513265

## ON GREAT CIRCLE FOR DISTANCE.—CAPE PALLISER TO SAN FRANCISCO.

Cape Palliser, Lat. 41° 37' S., Long. 175° 17' E.

San Francisco, Lat. 37° 48' N., Long. 122° 24' W.

Lat. 41° 37' = Co. Lat. 131° 37' and Lat. 37° 48' = Co. Lat. 52° 12'.

Long. 175° 17' E. to Long. 122° 24' =  $\frac{1}{2}$  diff. Long. 31° 9' 30'.

$\frac{1}{2}$  diff. Long. Sin. ... 9·7138305

Sin.<sup>2</sup> ... 19·4276610

Co. Lat. Sin. ... 9·8736722

Co. Lat. Sin. ... 9·8977123

2)39·1990455

19·5995227 ... 19·5995227

$\frac{1}{2}$  diff. Co. Lat. Sin. ... 9·8054191 ... Sin. 9·7229977

9·7941036 ... Sin. 9·8765250

48° 49'

Distance, 5,858 miles = 97° 38'

## GREAT CIRCLE FOR COURSE.—CAPE PALLISER TO SAN FRANCISCO.

(See Diagram No. 6.)

97° 38' ... 0·0038657 ... 0·0038657

62° 19' ... 9·9472027 ... 9·9472027

52° 12' ... 9·8977123 131° 37' ... 9·8736722

N. 44° 55' E. ... 9·8487807 S. 41° 55' W. 9·8247406

Course from  
Cape Palliser to San Francisco.

Course from  
San Francisco to Cape Palliser.

Lat. 41° 37' ... 9·8222

Tang. 44° 55' ... 9·9987

37° 48' ... 9·7874

41° 55' ... 9·9532

33° 31' ... 9·8209

175° 17' W.

28° 50' ... 9·7406

122° 24'

$$208^{\circ} 48' = 360^{\circ} = 151^{\circ} 12' \text{ W.} \quad 151^{\circ} 14' \text{ W.}$$

Long. of point where great Circle cuts the Equator.

Sin. 41° 55' ... 9·8248083

52° 12' ... 9·8977123

Bearing from Equator to either place, 31° 52' = 9·7225206

## ON GREAT CIRCLE FOR DISTANCE.—CAPE PALLISER TO TAHITI.

Cape Palliser ... Lat. 41° 37' S., Long. 175° 17' E.

Point Venus, Tahiti, Lat. 17° 29' S., Long. 149° 29' W.

REPORT OF THE SELECT COMMITTEE

Lat. 41° 37' = Co. Lat. 48° 23' and Lat. 17° 29' = Co. Lat. 72° 31'.			
Long. 175° 17' E. to Long. 149° 29' W. = $\frac{1}{2}$ diff. Long. 17° 37'.			
$\frac{1}{2}$ diff. Long. Sin.	...	9·4809366	
<hr/>			
Sin. <sup>2</sup>	...	18·6618732	
Co. Lat. Sin.	...	9·9794593	
Co. Lat. Sin.	...	9·8736722	
<hr/>			
		2)38·8150047	
		19·4075023	... 19·4075023
$\frac{1}{2}$ diff. Co. Lat. Sin.	...	9·3202495	
<hr/>			
50° 43' 2" Tang.	...	10·0872528	... Sin. 9·8887581
<hr/>			
		19° 16' 46"	... 9·5187442
Distance, 2,313·5 miles	=	38° 33' 32"	

GREAT CIRCLE OF COURSE.—CAPE PALLISER TO TAHITI.

(See Diagram No. 7.)			
38° 33'...	...	0·2053744	... 0·2053744
35° 14'...	...	9·7611063	... 9·7611063
72° 31'...	...	9·9994593	... 48° 23' ... 9·8736722
<hr/>			
W. 62° E.	...	9·9459400	S. 43° 48' W. ... 9·8401529
Course from			Course from
Palliser to Tahiti.			Tahiti to Palliser.

ON GREAT CIRCLE FOR DISTANCE.—AUCKLAND TO TAHITI.

Tahiti ... Lat. 17° 29' S., Long. 149° 29' W.			
Auckland, Lat. 36° 50' S., Long. 174° 47' E.			
<hr/>			
Lat. 17° 29' = Co. Lat. 72° 31' and Lat. 36° 50' = Co. Lat. 53° 10'.			
Long. 174° 49' to Long. 149° 29' = $\frac{1}{2}$ diff. Long. 17° 51'.			
$\frac{1}{2}$ diff. Long. Sin.	...	9·4864674	
<hr/>			
Sin. <sup>2</sup>	...	18·9729348	
Co. Lat. Sin.	...	9·9794593	
Co. Lat. Sin.	...	9·9032977	
<hr/>			
		2)38·8556918	
		19·4278459	... 19·4278459
$\frac{1}{2}$ diff. of Co. Lat. Sin.	...	9·2254625	
<hr/>			
		10·2023834	... Sin. 9·9279063
<hr/>			
		18° 25' 56"	... 9·4999396
Distance, 2,212 miles	=	36° 51' 52"	

GREAT CIRCLE FOR COURSE.—AUCKLAND TO TAHITI.

(See Diagram No. 8.)			
36° 52' ...	...	0·2218814	... 0·2218814
35° 42' ...	...	9·7660715	... 9·7660715
72° 31' ...	...	9·9794593	... 53° 10' ... 9·9032977
<hr/>			
N. 68° 5' E.	...	9·9074122	S. 51° 7' W. = 9·8912506
Course from			Course from
Auckland to Tahiti.			Tahiti to Auckland.

ON GREAT CIRCLE FOR DISTANCE.—TAHITI TO SAN FRANCISCO.

Tahiti	...	Lat. 17° 29' S., Long. 149° 29' W.
San Francisco,	Lat. 37° 48' N., Long. 122° 24' W.	

Lat.  $17^{\circ} 29' =$  Co. Lat.  $107^{\circ} 29'$  Lat.  $37^{\circ} 48' =$  Co. Lat.  $52^{\circ} 12'$   
Long.  $149^{\circ} 29'$  W. to Long.  $122^{\circ} 24'$  W.  $= \frac{1}{2}$  diff. Long.  $13^{\circ} 32' 30''$ .

$\frac{1}{2}$ diff. Long. log. Sin. ...	9.3694987			
Sin. <sup>2</sup> ...	18.7389974			
Sin Co. Lat. ...	9.9794593			
Sin. Co. Lat. ...	9.8977123			
	2)38.6161690			
	19.3080845	...	...	19.3080845
Sin. $\frac{1}{2}$ diff. Co. Lat. ...	9.6664622			
	9.6416223	...	...	Sin. 9.6034879
	30° 25' 56"	...	...	9.7045966
Distance, 3,652 miles $=$	60° 51' 52"			

GREAT CIRCLE FOR COURSE.—TAHITI TO SAN FRANCISCO.

(See Diagram No. 9.)

60° 51' 52"	...	9.9412572					
		0.0587428	...	...	...	0.0587428	
27° 5'	...	9.6582842	...	...	...	9.6582842	
52° 12'	...	9.8977123	...	107° 29'	...	9.9794593	
N. 24° 19' E. ...	9.6147393	S. 29° 49' W. ...	9.6964863				
Course from Tahiti to San Francisco.		Course from San Francisco to Tahiti.					
Lat. 17° 29' ...	9.4777	37° 48' ...	9.7874				
Tang. 24° 19' ...	9.6550	29° 49' ...	9.7582				
Diff. Long. 7° 44' ...	9.1327	19° 21' ...	9.5456				
Long. 149° 29' W.		122° 24'					
141° 45' W.		141° 45' W.					

Long of point where great Circle cuts the Equator.

Sin. of course 29° 49' ...	9.6964863
Lat. ... 52° 12' ...	9.8977123

From Equator to either place, 23° 08' ... 9.5941986

ON GREAT CIRCLE FOR DISTANCE.—SWAN ISLAND TO CAPE FAREWELL.

Swan Island ... Lat.  $40^{\circ} 44'$  S., Long.  $148^{\circ} 9'$  E.  
Cape Farewell, Lat.  $40^{\circ} 30'$  S., Long.  $172^{\circ} 42'$  E.

Lat.  $40^{\circ} 44' =$  Co. Lat.  $49^{\circ} 16'$  and Lat.  $40^{\circ} 30' =$  Co. Lat.  $49^{\circ} 30'$   
Long.  $148^{\circ} 9'$  to Long  $172^{\circ} 42' = \frac{1}{2}$  diff. Long.  $12^{\circ} 16' 30''$ .

$\frac{1}{2}$ diff. Long. ...	...	9.3275715			
Sin. <sup>2</sup> ...	...	18.6551430			
Co. Lat. Sin. ...	...	9.8810455			
Co. Lat. Sin. ...	...	9.8795287			
		2)38.4157172			
		19.2078586	...	...	19.2078586
$\frac{1}{2}$ diff. Co. Lat. Sin. ...	...	7.3088239			
89° 16' 38" Tang. $=$	11.8990347	...	...	Sin. 9.9999654	
	9° 17' 17"	...	...	9.2078932	
Distance, 1,114.5 miles $=$	18° 34' 34"				

REPORT OF THE SELECT COMMITTEE

GREAT CIRCLE FOR COURSE.—SWAN ISLAND TO CAPE FAREWELL.

(See Diagram No. 10.)

9·5021969

18° 34' ...	...	0·4978031	...	...	0·4978031
24° 33' ...	...	9·6185576	...	...	9·6185576
49° 16' ...	...	9·8795287	...	49° 30' ...	9·8810455
<hr/>					
S. 82° 8' W.	...	9·9958894	S. 83° 44' E.	...	9·9974062
Course from			Course from		
Farewell to Swan.			Swan to Farewell.		

ON GREAT CIRCLE FOR DISTANCE.—SWAN ISLAND TO POINT WINDSOR (OTAGO).

Swan Island ... Lat. 40° 44' S., Long. 148° 9' E.  
Point Windsor, Lat. 46° 13' S., Long. 166° 40' E.

Lat. 40° 44' = Co. Lat. 49° 16' and Lat. 46° 13' = Co. Lat. 43° 47'.	
Long. 148° 9' E. = to Long. 166° 40' E. = $\frac{1}{2}$ diff. Long. 9° 15' 30'.	
$\frac{1}{2}$ diff. Long. Sin.	... 9·2065186
<hr/>	
Sin. <sup>2</sup> ...	... 18·4130372
Co. Lat. Sin. ...	... 9·8795287
Co. Lat. Sin. ...	... 9·8400642
<hr/>	
2)38·1326301	
19·0663150	... 19·0663150
$\frac{1}{2}$ diff. Co. Lat. Sin.	... 8·6797263
<hr/>	
67° 40' 38"	... 10·3865887 ... Sin. 9·9661693
<hr/>	
7° 14' 5"	... 9·1001457
Distance, 868 miles = 14° 28' 10"	

GREAT CIRCLE FOR COURSE.—SWAN ISLAND TO POINT WINDSOR.

(See Diagram No. 11.)

14° 28' ...	...	0·6023785	...	...	0·6023785
18° 31' ...	...	9·5018538	...	...	9·5018538
43° 47' ...	...	9·8400642	...	49° 16' ...	9·8795287
<hr/>					
S. 61° 36' E.	...	9·9442965	S. 74° 26' W.	...	9·9837610
Course from			Course from		
Swan Island to Point Windsor.			Point Windsor to Swan Island.		

MEMORANDUM OF DISTANCES BY SAN FRANCISCO ROUTE.

Assumed Positions.

				Latitude.	Longitude.
Sydney	...	...	...	33° 51' 42" S.	151° 14' 0" E.
San Francisco	...	...	...	37° 48' 30" N.	122° 24' 0" W.
Tahiti, Point Venus	...	...	...	17° 29' S.	149° 29' W.
Wellington	...	...	...	41° 17' S.	174° 47' E.
Cape Palliser	...	...	...	41° 37' S.	175° 17' E.
Three Kings	...	...	...	34° 06' S.	172° 10' E.
Auckland	...	...	...	36° 50' S.	174° 49' E.
Swan Island, Bass Straits	...	...	...	40° 44' S.	148° 9' E.
Cape Farewell	...	...	...	40° 30' S.	172° 42' E.
Point Windsor (Otago)	...	...	...	46° 13' S.	166° 40' E.

Oceanic Distances by Great Circle.

Sydney to San Francisco	...	...	...	6447 miles.
" Tahiti	...	...	...	3307 "
" Wellington	...	...	...	1200 "
" Three Kings	...	...	...	1039 $\frac{1}{2}$ "
Cape Palliser to San Francisco	...	...	...	5858 "
" Tahiti	...	...	...	2313 "
Auckland to San Francisco	...	...	...	5669 "
" Tahiti	...	...	...	2212 "
Tahiti to San Francisco	...	...	...	3652 "
Swan Island to Cape Farewell	...	...	...	1114 $\frac{1}{3}$ "
" Point Windsor	...	...	...	868 "



*Local Distances.*

Cape Palliser to Wellington Heads ...	...	...	...	...	25 miles.
Wellington to Cape Farewell ...	...	...	...	...	130 "
Bluff to Port Chalmers ...	...	...	...	...	130 "
Port Chalmers to Lyttelton ...	...	...	...	...	190 "
Lyttelton to Wellington ...	...	...	...	...	174 "
Bluff Harbour to Point Windsor (Otago) ...	...	...	...	...	76 "
Melbourne to Swan Island ...	...	...	...	...	245 "
Auckland to Bay of Islands ...	...	...	...	...	125 "
Three Kings to Auckland ...	...	...	...	...	237 "
" Bay of Islands ...	...	...	...	...	120 "
Melbourne to Wellington, <i>via</i> Bluff, Port Chalmers, and Lyttelton ...	...	...	...	...	1683 "
Melbourne to Bluff, <i>via</i> Wellington, Lyttelton, and Port Chalmers ...	...	...	...	...	1983 "

*Summary.*

Sydney to San Francisco ...	...	...	...	...	6447 miles.
" " <i>via</i> Auckland ...	...	...	...	...	6946 "
" " <i>via</i> Wellington ...	...	...	...	...	7083 "
" " <i>via</i> Tahiti ...	...	...	...	...	6959 "
" " <i>via</i> Auckland and Tahiti ...	...	...	...	...	7141 "
" " <i>via</i> Wellington and Tahiti ...	...	...	...	...	7190 "
Melbourne to San Francisco, <i>via</i> Wellington and Tahiti ...	...	...	...	...	7479 "
" " <i>via</i> Bluff, Port Chalmers, Lyttelton, Wellington, and Tahiti ...	...	...	...	...	7673 "

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