

CONFERENCE OF DIRECTORS

OF

FAR EASTERN WEATHER SERVICES

HONG KONG, 1930.

84825

REPORT OF PROCEEDINGS

WITH APPENDICES

AND LIST OF DELEGATES.



PUBLISHED

BY

THE ROYAL OBSERVATORY, HONG KONG.

1930.

TABLE OF CONTENTS

CONFERENCE OF DIRECTORS
OF
FAR EASTERN WEATHER SERVICES
HONG KONG, 1930.

	PAGE.
Letter of Invitation to Directors of Far Eastern Weather Services	1
Circular issued by the Director of the Royal Observatory, Hong Kong	2
List of Delegates invited	5

MINUTES OF PROCEEDINGS.

First Meeting, April 28	6
Second Meeting, April 28	10
Third Meeting, April 29	15
Fourth Meeting, April 29	20
Fifth Meeting, April 30	23
Sixth Meeting, April 30	28
Seventh Meeting, May 2	31

APPENDICES.

1. Suggestions by Dr. C. W. Normand, Director General of Indian Observatories, regarding possible generalized modifications of the International System of Storm Warnings, to meet the needs of tropical countries	43
2. Letter from the Marine Superintendent of the Canadian Pacific Steamships, Limited	46
3. Letter from the Marine Superintendent of The Indo-China Steam Navigation Company, Limited.....	47
4. Letter from the Marine Superintendent of Messrs. Butterfield & Swire .	48
5. Letter from the Director of the Meteorological Service of Indo-China.	48
6. Letter from the Coast Inspector, Chinese Maritime Customs, Shanghai.	49
7. Proposals of Messrs. Cochin Chu (Nanking) and Pingjan Tsiang, (Tsingtao)	51
8. Note on Local Storm Signals by the Rev. Father L. Froc, S.J.	54
9. Memorandum on Meteorological Codes by Mr. C. D. Stewart, Superintendent, Malay Weather Service	55
10. Note on the Non-Local Storm Signal Code in use along the China Coast, by the Rev. Father L. Froc, S.J.	57
11. Resolutions adopted at the Conference	58
12. Codes proposed for adoption throughout the Far East	60.

HONG KONG.

CONFERENCE OF DIRECTORS OF FAR EASTERN WEATHER SERVICES,
HONG KONG, 1930.

Letter of Invitation.

Royal Observatory,
Hong Kong.
21st January, 1930.

Sir,

At a Conference of British Empire Meteorologists held in London in August, 1929, it was suggested that a Conference of Directors of Weather Services in the Far East should be held at an early date, to discuss the possibility of adopting

- (1) Uniform codes for local and non-local visual storm warning signals for the Far East.
- (2) A uniform code for the transmission in the Far East of Daily Weather Reports by cable.

This suggestion was agreed to and approved by the International Conference of Directors of Weather Services, held in Copenhagen in September, 1929. The Director of the Royal Observatory, Hong Kong, was asked to act as Convener.

I have the honour to enquire, therefore, whether it would be convenient for you to attend such a Conference. The Government of Hong Kong is willing to hold the Conference at Hong Kong, but would be glad to learn whether you prefer some other locale and to receive any proposals you may desire to make at the Conference.

It is suggested that the Conference should be held at the end of April or the beginning of May, 1930.

I have the honour to be,

Sir,

Your obedient servant,

T. F. CLAXTON,
Director.

Circular issued by the Director of the Royal Observatory, Hong Kong.

1930, March 10.

Sir,

I beg to forward herewith a copy of the Hong Kong Local Storm Signal Code, and an adaptation of the China Seas Storm Signal Code, which I propose for adoption in the Far East.

Also a copy of four tables prepared by the Director General of Indian Observatories, giving the International System of Storm Signals with possible additions and modifications.

I should like to draw your attention to the following resolutions passed at the meeting of Directors of Weather Services at Copenhagen in September, 1929.

(a) Resolution 25 (p. 33 of the Report)

“25 (IV—1928) Heures d’observations.

“Pour obtenir des observations synoptiques dans tous les Oceans, la Conférence estime necessaire de choisir comme heures d’observations synoptiques en mer.

“00,06,12 et 18 (T.M.G.)

“Cette resolution remplacera résolution XIV de Zurich (1926)”.

The question arises: are ships operating in the Far East to be asked to observe at International hours? and if so, will land stations also observe at these hours?

(b) Resolution 28 (page 34 of the Report)

“28 (VII—1928). Les messages seront fournis dans un code universel pour tous les Oceans avec des groupes additionnels pour les besoins locaux ou d’expérimentation.

“Pour améliorer la compréhension générale des besoins de la météorologie en mer et donner son maximum d’utilité à la radiotélégraphie météorologique, la Conférence demande que le code international des signaux actuellement en préparation, soit établi, pour la partie radiométéorologique en collaboration avec la Commission des Renseignements synoptiques du Temps.”

Are ships in the Far East to be asked to send their observations in one of the two codes adopted at the Copenhagen Conference (Resolution 57 on page 43 of the Report). If so, which? Alternatively, should ships be asked to continue to send their observations *en clair*, as at present?

We are all anxious to achieve uniformity in the demands from and in data given to ships, but at present there is great diversity of practice. Ships are asked for different data by, and receive different data from, the several Weather Services in the Far East, and various codes are used for weather reports and storm warnings.

When accepting the proposal for a conference of Directors of Far Eastern Weather Services, the Copenhagen Conference emphasised the importance of including in the code adopted for the Far East the information necessary to permit reports broadcast by W/T, to be issued according to the specification of the International Code, in particular as regards the groups.

DDFWW and BBVTT.

(Resolution 98 of the Copenhagen Conference).

The Hong Kong Code at present in use for transmitting daily weather reports by cable does not provide for "visibility", and includes only four types of weather. I have modified the code, therefore, so as to include visibility, on a scale of 0-4, which gives the International specification with sufficient accuracy.

I have also made provision for twenty-five types of weather, and altered the temperature scale slightly, as I consider the upper and lower limits of the existing scale are both too low.

To permit the inclusion of twenty-five types of weather the element "dry-wet temperature" has been omitted. For the purpose of these telegrams the omission is usually unimportant. Excessive humidity is the accompaniment of "thick fog" and the condition "very dry" might be included under "weather".

As these telegrams are used primarily for the construction of weather maps I have endeavoured to include in a six-letter code (the maximum allowed by the Cable Companies) as much data as can be displayed on the map, and have included under the sixth letter the expressions:—

Sky cloudless or less than $\frac{1}{4}$ clouded	Sky $\frac{1}{4}$ to $\frac{3}{4}$ clouded	Sky more than $\frac{3}{4}$ clouded	Sky overcast
--	---	--	--------------

to be represented on the map by the symbols:—



thus preserving the symbols used in the Hong Kong weather maps and giving a better representation of the state of the sky. The symbols can be drawn rapidly on the map and are readily distinguishable.

Though not perhaps of vital importance, it is desirable that the symbols used on the weather maps of various services should be uniform, and those under the sixth letter of the code are suggested for general use.

In 1915 some reporting stations considered that the Hong Kong Code was too complicated; but I submit that with a little practice, the code will be found perfectly simple to use, even by the inexperienced.

The Japanese Code for synoptic reports by wireless is excellent but does not provide for "temperature", or for "no observation". The table for "barometric pressure" might be substituted for the first two letters of the Hong Kong Code, if so desired.

I should be glad to receive your remarks on these communications.

Another point which I think should be discussed at the Conference is that of overlapping in synoptic broadcasts.

What is required is that each Service should receive observations from as many stations as possible over the area for which a weather map is prepared, with a minimum of overlapping.

Without knowledge of the local conditions it is not possible to formulate a scheme which is likely to be acceptable to all concerned, but any suggestion on the subject of an improved, economic scheme of broadcasting synoptic weather messages in the Far East would be very acceptable.

The proposed Conference of Directors of Far Eastern Weather Services is to be held in Hong Kong from April 28 to May 3. A draft programme will be forwarded to you in due course.

I should be glad if you would state whether you wish to make your own hotel arrangements while in Hong Kong or whether you would like me to book you a room at either of the following hotels :—

Hong Kong Hotel
Savoy Hotel
St. Francis Hotel
Peninsula Hotel. (Kowloon).

Yours faithfully,

(Signed) T. F. CLAXTON,
Director,

Royal Observatory,
Hong Kong.

LIST OF DELEGATES INVITED.

Monsieur E. Bruzon	(Indo-China)
Mr. Cochin Chu*	(China)
The Rev. Father Louis Froc, S. J.	(Zi-ka-wei)
Dr. Goto	(Korea)
Captain E. Hillman	(Chinese Maritime Customs)
Dr. P. Koloskoff	(Russian, Far East)
Dr. S. Kusama	(Dairen, Kwantung)
Dr. C. W. B. Normand	(India)
Dr. T. Okada	(Japan)
Mr. Pingjan Tsiang	(Tsingtau)
The Rev. Father Miguel Selga, S.J.	(Philippines)
Lieut. Comdr. Y. C. Shen, C.N.	(Pratas)
Mr. C. D. Stewart	(Malaya)
Dr. S. Teremoto	(Formosa)

The following gentlemen were invited to attend in an advisory capacity.

Captain R. H. G. Ashby	(Marine Superintendent, Messrs. Butterfield & Swire)
Captain A. W. Davison	(Marine Superintendent, The Canadian Pacific Steamships Ltd.)
Lieut. Comdr. A. E. Dodington, R.N.	(Fleet Meteorological Officer)
Lieut. A. St. J. Edwards, R.N.	(as French Interpreter)
Mr. C. W. Jeffries	(Chief Assistant, Royal Observatory, Hong Kong)
Captain D. Skinner	(Marine Superintendent, Messrs. Jardine, Matheson & Co.)

*Represented by Mr. S. W. Sung.

CONFERENCE OF DIRECTORS
OF
FAR EASTERN WEATHER SERVICES.

Held in the Council Chamber Hong Kong, from April 28 to May 2, 1930.

MINUTES OF PROCEEDINGS.

First Meeting, Monday, April 28, 1930, at 10.30 a.m.

Delegates Present: Monsieur E. Bruzon (Indo-China), Mr. T. F. Claxton (Hong Kong), The Rev. Father Louis Froc, S. J. (Zi-Ka-Wei), Mr. Pingjan Tsiang (Tsingtau), The Rev. Father Miguel Selga, S.J. (Philippines), Lieut. Comdr. Y. C. Shen, C.N. (Pratas), and Mr. S. W. Sung (China), representing Mr. Cochin Chu, Director of the National Research Institute of Meteorology, Nanking.

By Invitation: Captain R. H. G. Ashby (Marine Superintendent, Messrs. Butterfield & Swire), Captain A. W. Davison (Marine Superintendent, Canadian Pacific Steamships, Ltd.) Lieut. Comdr. A. E. Dodington, R.N. (Fleet Meteorological Officer, H.M.S. "Hermes"), Lieut. A. St. J. Edwards R.N. (as French interpreter), Mr. C. W. Jeffries (Chief Assistant, Royal Observatory, Hong Kong), Captain D. Skinner (Marine Superintendent, Messrs. Jardine, Matheson & Co.)

The Conference was opened by His Excellency the Officer Administering the Government (Mr. W. T. Southorn, C.M.G.) to whom the members were presented by Mr. Claxton.

His Excellency's Address: It gives me great pleasure, gentlemen, to welcome you all to Hong Kong, and we feel highly honoured that six gentlemen so distinguished in their own spheres of activity should have thought it worth their while to come to Hong Kong for a conference with the Director of our Observatory here. It gives us particular pleasure to welcome the Rev. Father Louis Froc, S.J., the doyen of Far Eastern Meteorologists. Father Froc, as you all know, has been the Director of the famous Zi-Ka-Wei Observatory for the past thirty-six years, with one brief interruption for reasons of health, and his work has been of inestimable benefit to shipping and to all who dwell in this part of the world. We hope he may long continue to preside over the Zi-Ka-Wei Observatory which he has served faithfully for so many years.

We also welcome the Rev. Father Miguel Selga, S.J. of the Philippines Weather Bureau, Monsieur E. Bruzon, of the Indo-China Weather Bureau, Mr. S. W. Sung of the National Research Institute of Meteorology, Nanking, Mr. Pingjan Tsiang, of the Tsingtau Observatory and Lieutenant Commander Y. C. Shen, C.N., of the Pratas Meteorological Station, the youngest of our Far Eastern Meteorological stations, and one in which the Colony of Hong Kong takes a special interest.

We regret the absence of the representatives of the Malayan, Japanese, Korean and Formosan services, without whom our numbers are not complete. They were unable to make arrangements to leave their posts, but we feel sure they will give due weight to any recommendations which may emerge from this Conference.

Situated as we are, gentlemen, in regions subject to disastrous typhoons, from which our respective territories have from time to time suffered incalculable damage, the subject of meteorology and particularly of storm warnings, assumes an importance which is not always appreciated in more favourably situated localities. The safety of shipping, and hence the prosperity of our trade in general, is largely dependent on our meteorological services, while the safety of life and property

ashore is to a less degree imperilled by typhoons, and can only be properly safeguarded by a system of timely warnings.

It is obvious, gentlemen, that a uniform code of signals would be of the utmost value to our meteorological services, if a uniform code suitable for all requirements could be devised. In August of last year the Director of the Royal Observatory, Hong Kong, attended a conference of British meteorologists held in London, with the laudable, if somewhat optimistic object of introducing a uniform code of storm warning signals for the whole world, but as agreement could not be reached even for the British Empire, he withdrew his proposal and suggested a conference of Far Eastern meteorologists, in the hope that uniformity might be attained over this area where conditions and requirements are, to a certain extent, uniform.

This Conference has therefore been called in accordance with the suggestion made by the Director in London, and has for its object the adoption throughout the Far East of uniform codes for storm warnings and for the transmission of daily weather reports by cable.

At present different weather services in the Far East use different storm warning codes and ask for different data from ships. This is very unsatisfactory to ships operating in these waters, and I would invite you very carefully to examine the proposals which will be laid before you, with a view to achieving the objects for which this Conference has been called.

In conclusion, gentlemen, I know that Hong Kong will derive much benefit from your visit, and I venture to express the hope, not only that you will find your stay in Hong Kong a pleasant interlude in your arduous and often lonely duties, but that you will also carry away the feeling that your visit has been profitable to the important services on which you are engaged.

I will leave you to your deliberations on matters too technical for me to be of any assistance, and you can settle down to the details of your work.

Mr. T. F. Claxton's Speech: I wish, gentlemen, to add a word of welcome to you all and thanks for your presence here today. Before proceeding with our formal business I am sure you will wish to thank His Excellency the Officer Administering the Government for coming here today to open the Conference.

His Excellency's kindly interest should help us in our deliberations and stimulate mutual understanding and goodwill, without which we cannot look for complete success in our undertaking.

We hope for great things from this Conference. Our motto is "uniformity and economy". Our bugbear is apathy, our handicap is want of money and our hope is in ourselves, our governments and the navies of the world, mercantile and fighting. It lies also in that vast, faithful band of observers who provide the bricks and mortar with which we build. Without them there would be no codes, no storm warnings and no weather maps. In your name and the name of all the meteorological services in the world, I thank them and bid them carry on the good work.

We hope as a result of this Conference that ships east of Singapore will receive all the meteorological information they want, in the form they want it, and when they want it. That they will be asked to keep only one meteorological log and to send extracts from it *en clair*, or in the International Code, to the various meteorological centres.

We hope that weather services in the Far East will obtain synchronous observations, without undue delay, from a sufficient number of stations to enable them to detect on their weather maps kinks in the isobars and isotherms, warm fronts, cold fronts and lines of flow; also that these observations may be received at sufficiently frequent intervals to enable the forecaster to anticipate and trace the passage of different types of weather.

Your Excellency, we thank you very much for opening our Conference.

Father Selga proposed Mr. Claxton as President of the Conference.

The proposal was seconded by Father Froc and carried unanimously.

Mr. Claxton: Gentlemen, I thank you for the honour you have done me in electing me President of this Conference. It is perhaps fitting that you should nominate me, for the sole reason that the Conference is being held in Hong Kong and I have made the arrangements for it. No one is more conscious than myself, however, how unsuited I am for the post. Nevertheless, I will endeavour to carry out the duties of President to the best of my ability.

Telegrams and letters regretting their inability to attend, were read from

Dr. T. Okada	Tokio, Japan.
Dr. Teramotu	Taihoku, Formosa.
Dr. Kusama	Dairen, Kwantung.
Dr. Goto	Zinsen, Korea.
Capt. H. E. Hillman	Coast Inspector, Shanghai.
Mr. C. D. Stewart	Malaya Weather Service.
Dr. C. W. Normand	Director General, Indian Observatories.
Dr. P. Koloskoff	Geophysical Observatory, Vladivostock.

Mr. Claxton proposed that the language used should be English. This was agreed to. Father Froc asked that communications in French should be printed in that language also. Mr. Claxton stated that this could be done.

Mr. Claxton: The first question for discussion is that of a code of Local Storm Warning Signals. I consider the code circulated to be more suited to our needs than the Indian Code or the International Code and propose its adoption throughout the Far East. Dr. Normand, the Director General of Indian Observatories, would like to see the Indian Code adopted. In it the first two signals are called "Distance Signals". No. 1 corresponds to No. 1 of the Hong Kong code. No. 2 states that a storm has formed; without further particulars. Nos. 3—6 are "Local Signals". *Cautionary. Warning. Danger and Great Danger.* I submit that this code will not meet the needs of the Far East.

Father Froc remarked that a ball was not the best symbol for visibility. At a distance, with haze, it takes some other shape and is hard to distinguish. Captain Tyler made many experiments with this symbol.

Mr. Claxton replied that he did not think that objection applied so much to local signals as to those which have to be read by passing ships.

Father Froc also stated that the "Red T" was difficult to distinguish and suggested that it should be coloured black.

Father Selga: Whereas in Hong Kong signal No. 1 is hoisted to denote that a typhoon is expected which would cause a gale in Hong Kong within 24 hours, and the same can be said to apply to other places, in the Philippines signal No. 1 does not necessarily mean that a gale is to be expected at the place within 24 hours, but it does signify the existence of a depression or a typhoon, although the distance and direction of motion of its centre may be still unknown. In the Philippines it is difficult to maintain constant communication with all towns, especially during the passage of a typhoon, because the lines easily break down. It would be unwise to delay the hoisting of typhoon signals until a true gale is expected to blow within 24 hours: by this time many lines would be down, with the disastrous result that the typhoon may pass over some towns without having received any warning whatsoever. Under the present system of communication and construction of houses in the Philippines, the earlier a typhoon is announced and its existence made known by the corresponding signal, the better for the safeguard of life and property, for the safety of shipping, and for the protection of agricultural crops. Typhoon signal

No. 1 of the Hong Kong local code should be modified in such a way, first, as to include not only a typhoon but a depression also, and second, as to eliminate the idea that the signal is to be hoisted only 24 hours before a true gale is expected.

Mr. Jeffries asked Father Selga how long the No. 1 signal would be put up before danger is anticipated, if the typhoon was as far East as Guam.

Father Selga replied that the typhoon signal No. 1 is hoisted as soon as the typhoon or depression begins to disturb the weather, sometimes even four or five days before any true gale strikes the locality. People keenly watch the change of the signals and their anxiety is not over until the signal is lowered.

Mr. Claxton stated that the practice of displaying the signal so long before there is any danger from a typhoon—although there may be a typhoon in existence—would not be possible in Hong Kong. It would disorganise the shipping in the harbour owing to certain regulations which have to be complied with. Signal No. 1 does not mean that a gale is expected at Hong Kong within 24 hours, but that a typhoon exists which may possibly cause a gale at Hong Kong within 24 hours.

Father Selga: In the Philippines, typhoon signal No. 1 signifies the existence of a storm, not necessarily a gale at the place within 24 hours. Consequently the regulations of the Customs Service require precautions and measures of slight character, as it is shown in the explanatory code of the typhoon signals now in force in the Philippines. If you keep in view that not only the city of Manila but various towns, scattered over several islands, are to be duly warned, it becomes obvious that the interests of the people of the Philippines are served best by hoisting typhoon signal No. 1 much earlier than 24 hours before the gale is expected to commence.

Mr. Claxton: In Hong Kong 24 hours warning is sufficient. The Non-Local Code shows where the typhoon is and where it is going.

Father Selga: Communication in the Philippines is very difficult. We have to announce the existence of a typhoon before the gale begins, and the telegraph wires are blown down.

Mr. Claxton stated that he did not see how complete warnings could be given with only a local code.

Father Froc: In the Local Code there is no provision made for indicating the distance of the typhoon.

Mr. Claxton: In Hong Kong this information is given in the Non-Local Code. We have two codes; the Local Code which warns Hong Kong and tells people what wind is likely to be caused by the typhoon, and the Non-Local Code, which gives the position of the typhoon and its direction of motion. This seems necessary for all ports in the Far East. It is impossible to give the requisite information in one code.

Mr. Jeffries suggested that Manila could adopt the Hong Kong Local Code with the exception of signal No. 1. In Hong Kong, with only one town to warn, such long notice is not required; but in the Philippines, as such a large area has to be warned, a longer interval would be necessary.

Father Selga: The fundamental ideas of the Local Code of typhoon signals of the Philippines are distance and relative position of the centre of the storm with reference to the locality where the typhoon signal is hoisted: Nos. 2 and 5 are intended for typhoons passing North, and Nos. 3 and 6 are reserved for typhoons passing South of the place: the difference between 2 and 5 or between 3 and 6 depending only on the distance of the centre. If Manila omits typhoon signal No. 1 from the list of typhoon signals, and accepts the other signals of the present Hong Kong Code, firstly, no signal would be available to denote the existence of those typhoons that form in the Pacific between Guam and the Philippines, but whose direction of motion is such that it is not yet known whether they are going to pass North or South of a place: secondly, in the absence of typhoon signal No. 1, only the signals 2, 3, 4 and 5 of the Hong Kong Code could be sent for the first time, which would mean that the towns would be warned only when winds of gale force would be actually expected, and only when the storm would be about to pass at its minimum distance from the

meridian of the town. Now, by that time most of the towns in the Philippines would be hopelessly out of reach, because of the break of the lines of communication. This implies two very serious consequences: first, that the towns would be left without warning to the great detriment of the people and discredit of the observatories: second, that the weather bureau would be unable to receive the observations that are made in the provinces at frequent intervals during the passage of the storm to follow the path of the typhoon. In answer, then, to Mr. Jeffries, I have to say instead of adopting the Hong Kong Code without signal No. 1, the obvious solution seems to be for Hong Kong to alter the meaning of typhoon signal No. 1 and eliminate the limit of 24 hours. Very likely all weather services, and certainly the Philippines Weather Bureau, need a first signal, as a premonitory sign.

After further remarks *Mr. Claxton* proposed that the discussion should be postponed and re-opened on Tuesday morning, after Delegates had had an opportunity of studying the question further.

The meeting adjourned at 12.30 p.m.

Second Meeting, Monday, April 28, 1930, at 2.30 p.m.

Delegates Present: Mr. T. F. Claxton (President), M. E. Bruzon, The Rev. Father Louis Froc, S.J., Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, S.J., Lieut. Comdr. Y. C. Shen, C.N., Mr. S. W. Sung.

By invitation: Captain R. H. G. Ashby, Captain A. W. Davison, Lieut. Comdr. A. E. Dodington, R.N., Lieut. A. St. J. Edwards, R.N., Mr. C. W. Jeffries, and Captain D. Skinner.

Mr. Claxton suggested that the adoption of the Non-Local Code be discussed. He mentioned that the proposed alterations to the existing code had been the outcome of ten years' experience.

Father Froc: There is a difference between a typhoon and a depression. There are forty-two codes in the world. I would not like to give Table No. 1 to sailors. I suggest that you make a difference between a typhoon and a depression. Often an anti-cyclone or a depression would be going in the same direction but would be of a different nature from a typhoon.

Mr. Claxton: It is not intended that information in Table No. 1 concerning an anti-cyclone or a depression should be exhibited on the mast. Our only doubt is whether we should exhibit the symbol "Typhoon or Depression".

Father Froc: In the existing code signal No. 9 of Table 3 indicates a Continental Depression.

Mr. Claxton: This has been taken out because it was thought that sailors could see from the latitude and longitude that the disturbance was a Continental Depression.

Father Froc: The distinction between the storms formed north of the tropics, on land, and the cyclones formed within the tropics, at sea, is imposed by different physical elements of the disturbances, and is not merely based on differences of positions and directions of motion:—

- (a) The first one, which we have always called "Continental Depression" is formed by the meeting of warm (equatorial) and cold (polar) currents of the air. Thence a discontinuity in the spirals of whirls and different states of meteorological elements in the different sectors of the storm. In front of the disturbance, almost invariably dense fog; in the SE, S and even SW sectors, high temperature, much electricity (atmospherics), thunder, drizzle and light or moderate breezes. In the NW or NE sector the squally line, sometimes sudden and heavy gales, with rain, cold temperature and no fog.
- (b) In the typhoons, or low centres developed at sea, only equatorial air is in action. From that homogeneity results the continuity of temperature, without warm and cold sectors. Rain, at sea at least, is

practically equally distributed all around the centre. The wind too is practically just of the same violence in every azimuth, and the terms "dangerous" and "maniable" semicircles apply to the manoeuvring the ships, not to the violence of the gales. No real fog exists in a typhoon, but the view is cut by blinding rain showers. No electrical display exists in the central part, and the "atmospherics" have decreased in all the cases we have been able to collect from ships having really passed through the centre of a typhoon. We may add that the swell and set is more dangerous and marked in a typhoon than in the case of extra-tropical cyclones or depressions.

For these principal reasons, I think it necessary to keep the distinction in the code.

Father Selga: In Manila information about typhoons is given to shipmasters and steamship companies by telephone, by a typewritten copy of the warning delivered by messenger to each steamship agency and by personal interview. Any Captain can obtain all the information available by personal examination of the weather map which is posted publicly in several places. Besides, the typhoon warnings are broadcast frequently by the wireless station N.P.O. No system of silent typhoon signals displayed on the mast could give more information than the information that is actually given.

Captain Davison: I would like to say that shipmasters have remarked to me that there are no non-local signals at Manila, and they feel that it is imposing on the authorities to keep ringing up for reports. In Manila sailors have felt the necessity of similar codes to those used in Hong Kong.

Father Selga: We are always pleased to give information to mariners and welcome inquiries about the weather. No master should feel that he is imposing on the personnel of the Weather Bureau when typhoon information is desired. Our desire is that ships leaving port should carry with them the latest information available at the moment: any subsequent position of the typhoon movement is communicated by wireless. It is considered that the introduction of the Hong Kong Non-Local Code in the Philippines at present would not be a wise decision, for the following reasons. First, the code is unnecessary, as the ports are sufficiently warned by the local signals. Second, in Manila, the port of greatest importance in the Philippines, the non-local signals are more unnecessary, as all information about typhoons is communicated to all ships' agents in greater detail than could be shown on the typhoon mast. Third, the system is unnecessary in the provincial towns, which receive all information of practical utility by means of the local signals. Fourth, for provincial stations and for the average inhabitant, and even sailors of inter-island vessels the system is too complex and burdensome. It would be unreasonable to expect the average citizen to be familiar with so many symbols and tables as enter in the interpretation of the code. It is greatly to be feared that disastrous errors might be made both by the observers in using the signals and by the inhabitants in interpreting them. Fifth, it is rather frequent to see in the weather map three or four typhoons at a time, which of the four is to be shown on the typhoon mast? A service would require four masts to show the four typhoons. Are we going to show successively every two hours, for instance, the position of the four typhoons? I am sure that this rapid change of signals would confuse and vex the sailors and the people. It cannot be stated that the typhoon mast should show that typhoon which according to the opinion of the forecaster is the most intense, because the shipmasters are entitled to know all typhoons that are actually disturbing the weather. A ship leaving Manila for Guam via San Bernardino Strait will be more concerned with a typhoon just forming over Yap than with a severe typhoon over Japan. The forecaster may be right in estimating the relative intensity of the various typhoons, but it is up to the captains to decide whether they will leave the port or not under the conditions. Consequently, they have to know the position not only of the strongest storm, but of all typhoons, actually in the weather map. This is actually accomplished by a typhoon warning in plain language given to the masters and by a message in plain language broadcast by wireless. Sixth, if the Non-Local Code is adopted for all towns of the Philippines, frequent cases will arise in which, on account of the break of the lines, it will be impossible to change properly the typhoon signals, to the discredit of the Observatory and to the detriment of shipping. The reasons seem to show that it is not advisable to introduce in the Philippines the Non-Local Code.

Lieut. Comdr. Dodington: If signal No. 9 of Table 3 were restored confusion might arise in connection with the signal for direction of motion, there being no column in the Table for "Continental Depression".

Mr. Claxton suggested that if "Continental Depression" were signalled its direction of motion should be indicated by the figures used for typhoons—02=N.N.E., 04=N.E. etc., and a note to this effect added to the code.

After further discussion, with this amendment and Father Selga's reservations the Non-Local Code proposed by Mr. Claxton was adopted.

Mr. Claxton: We will now discuss the adoption of the Six-Letter Code for the transmission of weather telegrams in the Far East by cable. This code has been used for many years and has been found fairly satisfactory, but, as mentioned in my circular of 1930, March 10, at the Conference held at Copenhagen it was requested that the code adopted for the transmission of weather telegrams by cable should be such as would enable the recipients of these weather telegrams to broadcast or re-transmit them in such a way as to comply with at least the two groups "DDFWW and BBVTT" of the International Code. The Hong Kong Code at present in use for transmitting daily weather reports by cable does not provide for visibility and includes only four types of weather. I have modified the code therefore so as to include visibility on a scale of 0-4, which gives the International specification with sufficient accuracy. I have also made provision for twenty five different types of weather and altered the temperature scale slightly, as I consider the upper and lower limits of the existing scale are both too low. To permit the inclusion of twenty five types of weather the element "dry-wet temperature" has been omitted. For the purpose of these telegrams the omission is usually unimportant. Excessive humidity is the accompaniment of "thick fog" and the condition "very dry" might be included under "weather".

As these telegrams are used primarily for the construction of weather maps I have endeavoured to include in a six-letter code (the maximum allowed by the Cable Companies) as much data as can be displayed on the map, and have included under the sixth letter the expressions:—

Sky cloudless or less than $\frac{1}{4}$ clouded.	Sky $\frac{1}{4}$ to $\frac{3}{4}$ clouded.	Sky more than $\frac{3}{4}$ clouded.	Sky overcast.
---	--	---	---------------

to be represented on the map by the symbols:—



thus preserving the symbols used in the Hong Kong weather maps and giving a better representation of the sky. The symbols can be drawn rapidly on the map and are readily distinguishable.

Mr. Pingjan Tsiang suggested one of the following symbols for "Sky overcast". (1) A circle with a central black dot. (2) a circle crossed by three horizontal bars. (3) two concentric circles, as the proposed symbol was identical with the international symbol for "solar halo". He also asked how time was sent in the Six-Letter Code.

Mr. Claxton: The proposed symbol for "overcast" is more easily distinguished than those suggested by Mr. Pingjan Tsiang. The similarity pointed out by Mr. Pingjan Tsiang should create no confusion, as explanations of the symbols are always printed on weather maps. Moreover, the symbol corresponds to "Solar halo" only when it indicates "overcast, calm"; on other occasions it is qualified by the wind arrow. Should, however, the Conference prefer one of Mr. Pingjan Tsiang's symbols I am willing to accept it rather than allow this difference of opinion to prevent the adoption of the code.

With regard to the other points raised by Mr. Pingjan Tsiang in his letter of April 19, 1930; time is sent in letter code adopted by the Cable Companies, who omit the letters "j" and "u". The letter "x" is proposed for a missing element as it is the International signal used for that purpose.

After further discussion the symbol  for "overcast" was agreed to.

Mr. Claxton: When this code was introduced in 1915 some reporting stations considered that it was too complicated, but I submit it will be found perfectly simple to use, with a little practice, even by the inexperienced. I hope, therefore, that you will not veto the code on this account. As regards the barometer code I should like your opinion as to whether it would be preferable to introduce the Japanese code for the first and second letter.

After discussion, the barometer code suggested by Mr. Claxton, was agreed to.

Father Proc: We think the International Code is too complicated for the Far East.

Father Selga: Manila Observatory uses the Hong Kong code in the transmission of all its cabled observations, in the reception of all cablegraphic reports except those from Japan and in the radio-telegraphic transmission of Philippine messages to Pratas and Nanking. The Hong Kong code, as modified by Mr. Claxton, is an improvement on the old code inasmuch as (1) it insures international uniformity, (2) makes provision for the inclusion of visibility, (3) is within the allowance of the Cable Companies, (4) makes reasonable reduction and extension in the temperature scale, (5) gives sufficient types of weather and (6) omits elements which are either unimportant or that can be inferred from other known data.

The words used in the scale of visibility seem to have been taken from Code VI (b) which is intended for ships, while the centres that will use the code daily are land stations. A declaration is desired as to what code of visibility is contemplated VI or VI (b) and what distance principle should be applied by all those who accept the new code, in the observation of visibility. It should be understood that this agreement does not inhibit any observatory from using other codes for inter bureau communication, or for communication with another meteorological centre after mutual agreement.

Monsieur Bruzon: En ce qui concerne l'état du ciel, le code apparait nettement insuffisant pour parer aux besoins de l'aviation. Je ne sais pas quels sont ceux-ci en Chine, mais en Indochine l'aviation devient de plus en plus active et elle exige de plus en plus de renseignements météorologiques.

Pour un aviateur, il n'est pas indifférent de savoir que le ciel est couvert par des nuages à 6,000 mètres ou par des nuages à 200 mètres. La hauteur du "plafond" est pour l'aviation un élément de première importance.

L'aviation est le service auquel la météorologie doit rendre le plus de services. Comme la météorologie, elle revêt déjà un caractère international et des avions faisant le tour du monde ont déjà réclamé l'assistance des météorologistes d'Extrême-Orient.

A mon avis, le code devrait au minimum permettre de signaler la proportion de nuages inférieurs.

En ce qui concerne la visibilité, il est une valeur importante: 1 kilomètre au-dessous de laquelle les vols sont dangereux sinon absolument impossibles. Au delà de 10 kilomètres, il n'est pas très important pour les besoins de la pratique de faire une distinction entre les divers degrés de visibilité.

La définition même de la visibilité devrait être modifiée. Ce devrait être la distance à laquelle la nature d'un objet peut être définie.

Pour la pression atmosphérique, l'adoption des millibars doit être envisagée. Le millibar est l'unité employé dans le code international.

Mr. Claxton: I agree with Mr. Bruzon that it is very desirable to know the height of the "ceiling" and the proportion of lower cloud, but it is not possible to include this information in a six-letter code; the maximum allowed by the Cable Companies. It might be given in messages sent by wireless telegraphy, however.

As regards the definition of the International Code for visibility, this is a matter which might be brought to the notice of the International Commission for synoptic weather information.

The points raised by Father Selga in connection with the scale for visibility were then discussed and it was decided to adopt the following scale:—0-1, 2-3, 4-5, 6-9, of code VI of the New International Code, in place of 0-2, 3-4, 5-6, 7-9.

With this amendment the Six-letter Code for transmitting weather telegrams by cable was unanimously adopted.

Mr. Claxton: The next point to consider is the time of observations. Many stations observe at 6 a.m. and 2 p.m. 120th meridian time, and some stations at 11 a.m. and 5 p.m. also. Of these times 2 p.m. is the only international hour. 6 a.m. is a very good time for Eastern China, but not so good for Indo-China. Japanese stations observe at 6 a.m. and noon of their own standard time i.e. 5 a.m. and 11 a.m. respectively, Eastern China time. It would be a very good thing if we could have absolute synchronisation of all observations received.

Mr. Pingjan Tsiang: I consider it would be as well to take advantage of this Conference to decide an hour of observation more convenient for Far Eastern countries, and we must not consider one locality only.

I propose that we conform with the hours of observation chosen by the Copenhagen Conference 1929, so that the stations in West China can have more convenient hours of observations, because the observatories of the West are of great value to the Meteorological Service.

In reality our map is not at all synoptic as we use Japanese observations which are made at 5 a.m. of the 120th meridian.

Father Selga: The absolute synchronisation of all observations received seems to be the supreme ambition of some meteorologists. We are asked to consider whether we should shift the present time of observations (6 a.m.) to two hours later, in order to make our times of observations coincide with international hours.

Even if we were to adopt the international hour 0000 G.M.T. or 8 a.m. Hong Kong and Manila time, synchronisation of observations would be far from complete, because it is very doubtful whether the Japanese service would agree to make observations at 8 a.m. It is a matter of common knowledge that the 2 p.m. weather map is not based on synchronous observations, because of the change Japan thought fit to make a few years ago in their time of observing.

Apart from that and absolutely speaking, I am against shifting the time of observation from 2200 to 0000 G.M.T. The system of communications in the Philippines is somewhat slow. Even now observations from other observatories of the Far East come rather late, making it difficult to have the weather map always ready by 11 a.m. Therefore to shift the time of observing to 8 a.m. would mean that the weather map, and the weather forecast based on it, would not be ready until about 2 p.m. Moreover, many of the observatories in the Far East have made and published for many years, observations made at 6 a.m. This homogeneous and uniform series of observations would be unnecessarily broken by the new scheme of observing hours.

Mr. Claxton: To obtain synchronous observations at 6 a.m. they would have to be made at 5 a.m. over Indo-China and Western China, and even 4 a.m. on the border, (we do not receive observations from so far West as this at present, but we might do so in the future). At present Japanese observations are one hour earlier than ours, and Indo-Chinese one hour later. Perhaps 6 a.m. is the best compromise.

Father Froc suggested that 6 a.m. be adopted, which would mean that maps would be ready before noon.

Mr. Claxton: I propose that we continue to observe at 6 a.m. 120th meridian time, and that we make another effort to induce the Japanese to observe at 6 a.m. 120th meridian time. We might also ask them to observe at 2 p.m. as well. At present 11 a.m. observations appear on our 2 p.m. maps.

This was seconded by Father Selga, and carried unanimously.

Mr. Pingjan Tsiang: We have adopted 6 a.m. and 2 p.m. of the 120th meridian, and I suggest that this Conference should stress the necessity of all stations falling into line with this decision, so that observatories in the Far East can make truly synchronous weather maps.

The Conference was in agreement with Mr. Pingjan Tsiang's suggestion.

Mr. Claxton suggested that the question of the code to be used in broadcasting synoptic weather messages from land stations should be discussed.

Monsieur Bruzon stated that wireless in Indo-China was more reliable than cable. Messages were frequently sent to and received from Tonkin without difficulty and he could not see the necessity for two codes, one for cable and one for wireless. Observations addressed to Phu-lien from Hong Kong and Manila were received by cable via Saigon, from which station they were transmitted to Phu-lien, either by wireless or by cable. The 14 hour observations from Manila, were frequently received very late in the evening and sometimes the following morning, too late to be inserted in the weather map.

Mr. Claxton: The Cable Companies will only allow six letters. We have to decide upon a code for wireless messages which will contain more information than can be sent by cable.

Lieut. Comdr. Shen intimated that he sent his messages either *en clair* or in code.

Lieut. Comdr. Dodington suggested that for synoptic messages the International Code should be used.

Monsieur Bruzon: Four groups of the International Code would meet our needs. Observers must be trained so as to be able to use this code. I suggest that the International Code should be adopted and any missing element be represented by "x".

Lieut. Comdr. Dodington: I suggest that it be left optional for the first four or five groups to be used, but I should like to see the fifth group included from stations at which barometric tendency in the preceding three hours will provide useful information to ships drawing synoptic charts.

After further discussion it was agreed that for the transmission of synoptic messages the International Code for land stations, as passed at the Copenhagen Conference of 1929, should be used—four groups obligatory and remainder optional, with a note to the effect that "x" means no observation.

The meeting was adjourned at 5 p.m.

Third Meeting, April 29, 1930, at 10 a.m.

Delegates Present: Mr. T. F. Claxton (President), M. E. Bruzon, The Rev. Father Louis Froc, s.J., Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, s.J., Lieut. Comdr. Y. C. Shen, c.n., Mr. S. W. Sung.

By invitation: Captain R. H. G. Ashby, Captain A. W. Davison, Lieut. Comdr. A. E. Dodington, R.N., Lieut. A. St. J. Edwards, R.N., Mr. C. W. Jeffries and Captain D. Skinner.

Minutes of the first two meetings were circulated for revision by Delegates.

Mr. Claxton in opening the proceedings referred to Dr. Normand's desire that the Indian Storm Signal Code should be used in the Far East. He emphasised the necessity, however, of using two codes in Hong Kong, and expressed the opinion that, used alone, the Indian Code would be insufficient.

Father Froc: The Indian Code would not be suitable for the Far East, and I approve of the Hong Kong Codes for general adoption.

Father Selga: The problem of the adoption of a local code of storm signals may be approached from two different, although not exclusive, points of view: first, from the standpoint of the marine meteorologist only, and second from the standpoint of marine and agricultural meteorology. The first is concerned almost exclusively with the safety of ships and the port: in addition to this, the second has to attend to the protection of lives and agricultural interest inland. Again the jurisdiction of a service may be limited to a port and a small surrounding area, while the extension of another service may cover several ports and a very large area devoted to valuable agricultural crops. The needs of Hong Kong and Shanghai, seaports of great importance indeed but with small area of hinterland under their jurisdiction to be protected, are very different from those of the Philippines, where the number of Islands, the extent of the territory and the difficulty of communication combine to tax the liability of the meteorologist to give adequate and timely warnings to all. The Hong Kong Local Code as at present framed may meet the needs of Hong Kong, but is insufficient for the needs of the Philippines. First, in the Hong Kong Code no provision is made for signalling depression but the first signal means wind of gale force may possibly occur within twenty four hours. It is well known that over Visayas and Northern Lundayas, specially in the latter part of the year, depressions develop frequently, which although shallow in barometric depth and feeble in cyclonic circulation, are attended by dirty weather and excessive rains, which cause floods and destruction of valuable crops. The Hong Kong Code applies to typhoons only with their attendant gales, whereas Manila Observatory wishes to give, and our communities certainly expect, warnings of the depressions which although not producing gale force in any locality are nevertheless capable of causing considerable damage inland and interfering with navigation on account of the very low visibility induced by them. Second, in the Hong Kong system, no signal can be displayed for winds less than of gale force and not in advance of twenty four hours before they begin to blow: in the Philippines, given the present condition of the system of communications of construction of houses and watercraft, it would be unsafe and unwise to adopt this system. Third, in the Hong Kong system, the signals by themselves alone do not convey the idea that the winds at the place are expected to veer or back: nor do they denote that the typhoon is expected to pass N or S, E or W of the locality. In the Philippines the signals themselves indicate both distance and bearing of the centre of the storm, denoting whether the storm is to pass N or S of, at short or long distance from the locality and the subsequent shifts of the wind. The knowledge of the azimuth of the storm is very important to decide whether to leave port or not, and the knowledge of the shift of the wind is of incalculable value to the mass of the people, because all persons, even the unlearned, know from what quadrant they should protect their houses against the incoming winds. Fourth, unlike the Philippine code, the Hong Kong system makes no provision for signalling the conditions that are expected to prevail when a typhoon passes over the locality.

Apart from this, I would suggest that the quadrant indicated by the present numbers 2, 3, 4, 5, of the Hong Kong code should be changed to NW instead of W, to NE instead of N, to SE instead of E and to SW instead of S. From the description given in the Hong Kong chart, it seems there is lack of uniformity between the signals displayed in Hong Kong harbour and the subsidiary signals hoisted in places in the immediate vicinity.

Mr. Claxton: These subsidiary signals merely intimate that a signal of the Local Code is displayed in the harbour, the complete code of local signals is not duplicated at these places on account of expense, and owing to the few people interested.

We have no objection to altering the signification of the present No. 1 signal to include the possibility of a depression or typhoon, and also to add another to cover the case of depressions causing excessive precipitation.

The Hong Kong Local Code is admittedly for typhoon warnings only. The position and direction of motion of depressions (and typhoons) is given by the Non-Local Code. Signals Nos. 2 to 5 of the existing Local Code do not indicate whether the

wind is expected to veer or back. This information is conveyed by the order in which the signals are displayed.

Father Selga: The depressions or typhoons of little importance, indicated by signal No. 1, cause at times severe floods, specially in southern latitude in the latter part of the year, although the wind in them is not of gale force.

I would emphasise the fact that only one code is necessary in the Philippines, and similar conditions obtain in India

Mr. Claxton: Japan, Hong Kong and, I believe, Indo-China, find both necessary.

Monsieur Bruzon: En Indochine, les avis de typhon sont transmis aux ports, aux sémaphores et aux navires soit par fil, soit par radio. Les mêmes avis sont communiqués à un certain nombre d'organismes officiels aux Chambres de Commerce, à la presse, aux entreprises privées qui en ont fait la demande. En sorte que dès qu'un typhon pénètre en Mer de Chine, une partie importante de la population en est avertie. Quand un typhon devient menaçant pour les côtes mêmes de la Colonie, de nouveaux avertissements sont envoyés en clair, par fil et par radio, qui indiquent la région littorale directement menacée. A ces avis, la plus large publicité est donnée par les autorités administratives. Des signaux locaux n'apparaissent pas nécessaires ni suffisants. Le code non local est au contraire absolument nécessaire.

Father Froc: No local signals are used in Shanghai, but on the non-local signal being hoisted those interested enquire at the Harbour Office or Observatory for further details. I am prepared to adopt any local code which may be agreed upon by the Conference.

Monsieur Bruzon: Indo-China has densely populated areas and large numbers of villages, and it would be impossible to warn by signals on the mast, but local authorities spread the news after receipt.

Father Selga: In the Philippines also, the greatest publicity is given to the typhoon warnings, which are broadcast by the navy and commercial wireless stations, are telegraphed to all post offices for the information of the public and are sent at the expense of the Philippines Weather Bureau to the observers for transmission to the provincial and municipal authorities, who in turn spread the information by means of the police and town criers. In Manila, besides, a system of lighted numbers has been introduced and the use of a suitable system of sounds to be produced by an electric siren, is seriously contemplated.

Mr. Claxton: I would suggest agreement by inserting signals in the local code which would meet the requirements of the Philippines. There are several codes in use in the different ports and I would suggest amalgamation of the Manila and Hong Kong Codes.

Father Selga: I am prepared to agree if "depression" is introduced, and the twenty-four hour limit eliminated in the No. 1 signal symbols. Nos. 2—5 to include indication as to veering and backing. I would also suggest the use of a flag. No. 1 could mean "depression or typhoon in existence somewhere".

Monsieur Bruzon: If a captain of a ship sees the Non-Local signal showing what danger and where, he can move or otherwise at his discretion.

Mr. Claxton: I consider two codes to be very necessary, one to indicate danger to the port and the other to warn shipping of the position and direction of motion of the typhoon.

Mr. Pingjan Tsiang: I am in favour of local signals to suit a particular locality, and in large areas like China, each locality would have to exhibit different signals for the same disturbance. I generally consider it impossible to have a uniform local code, but I see no objection to a universal non-local code.

Mr. Claxton: I see no difficulty in adopting a uniform local code. Different warnings would have to be sent to various towns in a large area according to their geographical positions, but that only means the display of different signals of the same code in different towns.

Father Proc: I have no experience of the local code, we do not use it in North China, but I think it would be an advantage to have a uniform local code. For steamers which do not carry wireless a non-local code is specially necessary. I am prepared to accept the local code, and consider the non-local code to be very necessary.

Mr. Pingjan Tsiang: I do not understand whether it has been decided to have two codes. I would suggest that it be first decided that we have two codes before we discuss any one code.

Mr. Claxton: I would suggest that we put it to the vote whether the Conference considers that two codes or one, shall be adopted by the various Services in the Far East.

Father Selga: I do not see the necessity of deciding that question. The important point is to decide which code is going to be used. If any country feels the need of a local code and others do not feel the same need, the country that does not require the code will not use it. For instance, if Shanghai does not see the necessity of a local code for Shanghai they will not use the symbols which other countries have adopted. For the purpose of our discussion I do not see the necessity of deciding whether one or two codes can be used.

Mr. Claxton: I should like to add that any decision of this Conference could not be considered binding by our respective Governments but merely an expression of opinion by the Conference. On further consideration I agree with Father Selga that it would be as well not to take a vote on this subject.

We have the case of Indo-China, which considers a non-local code essential and a local code not essential. Manila considers a local code essential and does not require a non-local code. Shanghai requires a non-local code and has no objection to adopting any local code agreed upon. Hong Kong definitely requires a non-local code and a local code.

Mr. Pingjan Tsiang: I consider that a non-local code is absolutely essential and that a local code is not essential.

Lieut. Comdr. Shen: I consider that a non-local code is essential and that a local code is also necessary, but it should be suited to the inhabitants of the country and should not be universal.

Mr. Claxton: That brings us to a deadlock. I am afraid, on the spur of the moment, I am not prepared to offer a solution. Perhaps Father Selga would help us.

Father Selga: I think we are all for uniformity, if possible, and we are willing to compromise. I do not see why it is not possible to have a local code which might be uniform. If certain countries need a non-local code they could adopt both and if one of them is unnecessary they need not use it. I feel that a non-local code is at present unnecessary in the Philippines, I do not see the necessity of a non-local code. Perhaps we could modify in a certain way the Hong Kong system so as to make it agreeable to you and us. I would suggest for No. 1 "typhoon or depression", Between No. 1 and No. 2 could be inserted two signals which I would call 2 and 3, after No. 1 No. 2 to mean strong winds from the South-West, and No. 3 strong winds from the South-East. Let us have your Nos. 2, 3, 4 and 5, which in the sequence would be 4, 5, 6, and 7 with the same meanings which are the International meanings. Here I make a sacrifice, in one case "Gales commencing from the South-West", which perhaps out of a thousand cases would only happen once in the Philippines. A gale commencing in the South-West, would mean that the typhoon came from the North-East and was moving towards

the South-West. Instead of giving "gale from the North" we might say from the "North-West". "North" means any wind from the North-West to the North-East, and "South" means any wind from the "South-West" to the South-East.

Mr. Jeffries: Would you imply the change of wind direction in that particular order?

Father Selga: Not necessarily.

Mr. Claxton: I am quite prepared to accept Father Selga's proposals.

Father Selga: Suppose we have as No. 8 your No. 6, which means that the gale is expected to increase, and perhaps you do not know whether it is passing North or South. It would be a temporary signal to be replaced later by other signals. No. 9 would mean wind of typhoon force expected from any direction?

Mr. Claxton: Yes; not necessarily that the typhoon will pass over the locality however, but near enough to produce a wind of typhoon force. It is usually difficult to say whether it will pass to the North or to the South until the centre is relatively near Hong Kong.

Father Selga: I think it would be worth while in considering a signal for a typhoon passing over a locality, to warn people that strong winds are to be expected after the lull. They may see a clear sky, but the typhoon is not over when the calm comes and they ought to be ready for winds from the other quarter.

Mr. Claxton: You could explain that, when signal No. 9 is hoisted the wind may fall light as the typhoon passes over, but would then blow with equal violence from the opposite direction. It would explain the calm and people would get ready for the second blow.

Father Selga: This would suit your point of view and ours.

Mr. Jeffries: Father Selga, you have mentioned two new symbols which you propose to hoist and these two give warning of strong wind from two directions, South-West and South-East. Do you mean this to be actually South West and South East, or do you mean quadrants of which these are the mean direction. There is a case in which one of these signals might be very useful indeed in Hong Kong. A typhoon passing far to the South gives us rainy weather and high winds but not necessarily of gale force. The wind would usually come from the East; your two symbols "South West and South East" would not quite meet the case, unless the signal implied the mean direction of the quadrant.

Father Selga: This shows the non uniformity of the local conditions. In the Philippines it is the contrary, when a typhoon passes South of Manila the Easterly winds are very mild. We are more afraid of a typhoon that passes North of Manila 100 miles than one which passes 20 miles South.

In reply to Father Selga, *Mr. Claxton* said the code would only provide warnings of depressions in so far as it is shown by signal No. 1 that there is a typhoon or depression which may possibly cause a gale, and the proposed signals--No. 2 "Strong winds may occur from South-West (South to West)" and No. 3 "Strong winds from the South-East (East to South)". If you consider that sufficient for depression warnings and would accept the Local Code including those three signals, I am sure we should all be very pleased.

Messrs. Pingjan Tsiang and Tung, and Lieut. Comdr. Shen, intimated that they were quite prepared to use a uniform local code provided it meets the requirements of all services.

Mr. Claxton: With reference to the symbols of the code, it has been the practice to have only one symbol for local signals in Hong Kong. In the Manila Code in some cases one symbol is used and in others two. Is it not better to have one symbol throughout the code? It might possibly be confusing to the sailors to see sometimes one symbol and sometimes two.

Captain Ashby intimated that it would make no material difference.

Captain Davison : I think it would be more convenient to have one symbol.

Captain Skinner : The idea is to convey as much information with a minimum of signals, and if we can convey the same meaning with one symbol, I do not think it is necessary to have two.

In reply to Mr. Claxton *Father Selga* stated that he had no objection to retaining the present symbols for signals 2, 3, 4, 5, 6, and 7 of the existing code.

Captain Skinner : Might I suggest that No. 1 signal should mean "Depression or typhoon exists which may affect the locality"?

Father Selga : I think that would do for everywhere.

Mr. Claxton agreed.

Mr. Claxton : Are you all agreed that the Local Code with the suggested amendments should be adopted throughout the Far East.

Lieut. Comdr. Shen and Messrs. Pingjan Tsiang and Sung asked that the amendments should be given to them in writing before they agreed as they had not fully understood the discussion.

Mr. Claxton : Certainly. I propose, therefore, that we adjourn and I shall endeavour to have copies ready tomorrow morning to enable the Delegates to study the question further before coming to a decision.

The meeting, was adjourned at 1 p.m.

Fourth Meeting, Tuesday, April 29th, at 2.30 p.m.

Delegates Present : Mr. T. F. Claxton (President), M. E. Bruzon, The Rev. Father Louis Froc, S.J., Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, S.J., Lieut. Comdr. Y. C. Shen, C.N., Mr. S. W. Sung.

By invitation : Captain R. H. G. Ashby, Lieut. Comdr. A. E. Dodington, R.N., Lieut. A. St. J. Edwards, R.N., Mr. C. W. Jeffries and Captain D. Skinner.

Father Selga made the following proposal :—"The Conference recognises that the meteorological station established at Pratas by the Government of China is of great importance for the meteorology of the China Sea. It expresses the hope and voices the desire that similar stations be established in zones not yet represented, especially on the Macclesfield Bank and the Paracels".

The proposal was seconded by Mr. Claxton and carried.

Lieut. Comdr. Shen : I will petition my Government to open stations on the Macclesfield Bank and Paracels.

Mr. Claxton : We all appreciate the very efficient manner in which the Pratas Meteorological Station has been run and is still being run, and very much hope that we shall eventually obtain observations from Macclesfield Bank and the Paracels.

Captain Skinner : The station on the Pratas Reef is of great assistance to shipping, and it would be an advantage to have similar stations at the Paracels and on Macclesfield Bank.

Father Froc : As I consider the erection of a lighthouse and wireless station on the Paracels Reef to be of vital importance to the safety of shipping in the China Sea, I wish to associate myself with the remarks made by other Delegates, to show our unanimity on this subject. I have spoken to successive Commanders-in-Chief of the China Squadron in favour of this project, and mentioned that the cost, though heavy, would be light when weighed in the balance against the loss of a first class cruiser-

on the reefs. There has always been the doubt, however, as to what flag would be hoisted.

Captain Ashby: I would mention that it is almost an impossibility to get any wireless message West of Hainan in the Gulf of Tonkin. I have experienced this difficulty many times on my ship.

Mr. Claxton: We might make inquiries with a view to ascertain the cause of this blind spot in the Gulf of Tonkin.

Monsieur Bruzon: Je suis très surpris par cette déclaration. Nous sommes en relation avec de nombreux capitaines de navires fréquentant le Golfe du Tonkin et ceux-ci ont toujours reçu régulièrement les avis de typhon et les bulletins météorologiques. Trois stations travaillant sur 600 mètres peuvent être entendues: Kouang-Tchéou-Wan, Kiên-An et Tourane.

Mr. Claxton: We will now revert to the proposed six-letter code for transmission of weather telegrams throughout the Far East by cable. Yesterday the code was passed with certain alterations under the column "Wind force and visibility". The visibility code has since been reconsidered and we are not sure that the decision we arrived at yesterday is the best one

Father Selga: I do not see a great difference as far as distance is concerned, the only point is that we have to convey the impression to all people that we are using ships' visibility and most of the stations will be land, not ships. To avoid inconsistency I suggest that we use the other scale. Certain land stations, such as lighthouses, are something like ships, and they should use in that case observations of visibility taken from the code of ships and the inland stations should use the other.

Mr. Claxton: We should consider only the land stations because ships will use Table VI (b) of the International Code. There is very little difference between the scales in Table VI and Table VI (b).

Lieut. Comdr. Dodington suggested that the grouping should again be discussed.

After discussion the Conference agreed to adopt the original method of grouping 0-2, 3-4, 5-6, and 7-9, according to Code No. VI of the International Code, 1929, which gives visibility on the land and not horizontal visibility from ships at sea.

Mr. Claxton: With regard to the column "weather" in the six-letter code I have left 15 vacancies, and I would suggest that any Delegate having suggestions to make for completing the column should send them to me as soon as possible, in order that we may discuss them before the Conference closes and so avoid future correspondence.

Monsieur Bruzon: I will make some suggestions tomorrow morning.

Father Selga: I would suggest that the matter of filling up the 15 blanks in the code be left for future correspondence between Observatories, after we know from experience whether it would be satisfactory.

Mr. Claxton: Do Delegates consider that the question of filling up the 15 blanks in the code should be settled later by correspondence, in the light of future experience?

It was agreed that the question of filling the column "weather" in the six-letter code should be left to be dealt with by correspondence and the column adopted in its existing form for the present.

Mr. Claxton: With reference to the Barometer Code. This is a small matter, but is one which must be settled. You have seen the Japanese Code which gives, by means of two letters, every millimetre from 710 to 780, the interval being 0.2 of a millimetre from 710 to 720 millimetres and 0.1 of a millimetre from 720 to 780. In the proposed code the barometer is given for 714 millimetres to 786 millimetres to

every 0.1 of a millimetre, except in five cases. It is simpler to represent in the code and I propose that it should stand unless anyone particularly prefers the Japanese Code. Do you agree that the Barometer Code suggested in the form you have before you should be adopted.

Agreed unanimously the amended Six-Letter Code be adopted.

Mr. Claxton: With regard to the Non-Local Storm Warning Code; this was approved with the exception that Signal No. 9 of the existing Table 3 should be included. To do so means erasing the condition "Deepening", which I have entered as No. 7. We have the expression "Deepened" so I think there is no great harm in erasing "Deepening". I suggest that we make No. 7 indicate "Deepened", No. 8 "Exceptionally high rate of travel" and No. 9 "Continental Depression".

Agreed.

Mr. Pingjan Tsiang: I agree that the symbols of Table 4, indicating hours, should be changed; that is to say by choosing symbols to show the time at which the typhoon or depression was in the position indicated.

Mr. Claxton: I have mentioned that all other Services are at liberty to use their own Table 5, which gives the districts visited by monsoon gales. I should like to know whether any Delegate here today, wishes to alter that table. It is the code in use at present.

No Delegates having anything further to add, Table 5 was adopted.

Father Proc: With regard to Table 2, I would take the liberty to propose complete signals for the re-curving in the track by adding some more points of the compass, viz., those with a S. component.

Father Proc quoted cases of ships being wrecked because the captain had been led to believe that typhoons did not travel to the South of West.

It was agreed that the eight principal points of the compass be inserted in Table 2. The word "V-shaped depression" was also inserted in the column "Depression of Table 2.

In answer to *Lieut. Comdr. Dodington*, *Mr. Claxton* stated that when the expression "Continental Depression" is sent the direction of motion will be given by means of figures under column 2 of Table 1. 02, 04, 06, etc., as there is no column for "Continental Depression" in this Table.

Mr. Claxton: I think it may be considered that we are all agreed as to the Non-Local Code, but Father Selga does not commit the Philippines to use it.

Father Selga: We do not see the necessity of using or introducing the code. If the time arrives when either Manila, or other ports, need non-local storm signals, we will give the preference to the code which is now being considered.

Father Proc: Could you substitute "Typhoon or Cyclone" for the word "Typhoon"? In the Atlantic they call them cyclones, although they are exactly the same. If the code has later any chance of being adopted in other countries, they would think typhoons would not apply to them, whereas a typhoon is the same as a cyclone.

Mr. Claxton: I think there is no objection to using the expression "Cyclone or Typhoon" as in the Manila Code.

Captain Skinner: For the Non-Local Code are we to understand that the symbols as now existing will apply to China Coast Ports

Mr. Claxton: They will be the same as at present, but those in Table 2 will have slightly different meanings. Table 2 is extended. We shall be able to signal that a typhoon is filling up or curving N. or N.E. At present we have no means of doing so.

The question of displaying on the signal masts the symbols under column "Typhoon or Depression" of Table 1 was reserved for discussion at the next meeting.

Mr. Claxton: We have not yet settled whether we are to ask ships to observe at International hours in the Far East. In view of our decision to retain the hours of 6 a.m. and 2 p.m. (120th meridian) for land observations, I suggest that that we do not ask ships to alter their present times of observation, but to observe at 6 a.m. and 2 p.m. (120th meridian) and to send the observations to the various observatories with as little delay as possible. Also to send 11 a.m. and 5 p.m. observations whenever possible.

After discussion this was agreed to.

Mr. Claxton: There is also the question as to whether we are to ask ships to use code or to continue to send observations *en clair*.

After discussion it was decided to ask ships of the mercantile navy to continue to send their observations *en clair*.

Lieut. Comdr. Dodington asked if ships might be allowed to use code if they wished.

After consulting the Delegates *Mr. Claxton* replied in the affirmative.

The meeting adjourned at 5 p.m.

(Signed) T. F. CLAXTON.

Fifth Meeting, Wednesday, 30th April at 10 a.m.

Delegates Present: Mr. T. F. Claxton (President) M. E. Bruzon, The Rev. Father Louis Froc, S.J. Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, S.J. Lieut. Comdr. Y. C. Shen, C.N. Mr. S. W. Sung.

By Invitation: Captain R. H. G. Ashby, Lieut. Comdr. A. E. Dodington, R.N. Lieut. A. St. J. Ewdards, R.N. Mr. C. W. Jeffries and Captain D. Skinner.

Draft Minutes of the third and fourth meetings were circulated for revision by Delegates.

Mr. Claxton read the following telegram received from Father Gherzi, of the Zi-ka-wei Observatory, Shanghai:—"Wishing full success to the Conference. Best regards to you and Father Froc and to all". The following reply was sent to Father Gherzi:—"Many thanks for your telegram. All well here. Conference progressing satisfactorily".

Mr. Claxton: Captain Skinner has suggested that Table 2 of the Non-Local Code should be in addition, not alternative, to Table 1. This however is impossible, as the signals constitute the two upper symbols of the hoist, as do the signals of Table No. 1. They are needed when it is not possible to give the direction of motion of a typhoon. Does this explanation satisfy you, Captain Skinner?

Captain Skinner expressed himself as satisfied.

Mr. Claxton: We have adopted the revised China Seas Non-Local Storm Signal Code, but the question has not been settled as to whether the symbols for direction of motion in the column headed "Typhoon or Depression" should be exhibited on the signal masts or whether we should continue to exhibit only the symbols under column "Typhoon". It is true that sailors know what this means without reference to any code: 02=N.N.E. 04=N.E. and so on. I doubt, however, whether a careful sailor would trust entirely to his memory in reading the

other signals exhibited on the mast. He would probably like to verify them by reference to the code. If so he might refer to the code in the first instance to find out what direction of motion is indicated by figures other than 02. 04. 06. etc.

Personally I am in favour of exhibiting on the masts the symbols given under the column "Typhoon or Depression", but should be glad to have the views of other Delegates on the subject.

Father Froc: I am of the opinion that Column 2 of Table 1 should be used in all cases for hoisting the signals of the direction of motion at the semaphores. The distinction between Typhoons and Continental Depressions is provided for by the third signal of the hoist. The other columns of the table are for the communications between the observatories and telegraphic messages. An optional use of column 3 could be proposed.

Mr. Pingjan Tsiang: I prefer to have a more uniform system for use in ports in the Far East. I consider that for the safety of ships, it is preferable to signal "Typhoon" or "Depression" separately, than to have one signal for "Typhoon or Depression", which might be confusing: but if everyone is in agreement we will give our support.

Mr. Sung and Lieut. Comdr. Shen were in agreement with *Father Froc* and *Mr. Pingjan Tsiang*.

Captain Skinner: I would like to say that although wireless is prevalent there are some ships without, and I think it would be helpful to have the signal "Typhoon or Depression" hoisted, as the shipmaster would then take the necessary steps. *Father Froc* mentioned that symbol No. 9 would apply to a "Depression forming in the China Seas", would you call that a Continental Depression. I am in favour of seeing column 3 signals hoisted.

Captain Ashby: I am inclined to agree with *Captain Skinner* on that point.

Father Selga: I am not interested in its adoption on account of not having non-local codes in the Philippines. I agree with the two captains that in the China Seas and in the Pacific sometimes we get depressions which are no more than depressions, but when they travel across the China Seas they differ considerably. A ship without wireless may be in a serious position, for a depression sometimes develops into a typhoon.

Father Froc: I think all depressions are not the same as Continental Depressions, but in many cases in a few hours they turn into a typhoon. We always signal "Typhoon" for a depression. I would like to have the first signal "Depression or Typhoon".

Mr. Claxton: If the observatory signals definitely that there is a typhoon in a certain position and a ship goes out to find beautiful weather in that position, it throws discredit on the observatory. There are cases where this has happened, and I am inclined to maintain my view that it would be a good thing to exhibit the numbers in column 3 at the yardarm. However, it is for us to come to a decision. I think we should all act alike.

Father Froc: It could be decided that column 3 is optional. If the sailors have a code in their possession they would know what it means.

Mr. Claxton: I should like to make this quite clear to all Delegates. If we accept *Father Froc's* concession it might give sailors the impression that at Shanghai they always call a depression or disturbance a typhoon, whereas in Hong Kong they distinguish on the mast between typhoons and the doubtful case of "typhoon or depression". Can we call this complete uniformity?

Monsieur Bruzon: A ship which does not carry wireless, in the Philippines may get a signal "depression", it would then carry on quite happily, but as a depression in the China Seas may turn into a typhoon, the ship would be unprepared for it.

Mr. Claxton: In this table we distinguish between "typhoon", "typhoon or depression" and "depression". There is no question of displaying on the mast the figures under the column "depression". We know that depressions passing across the Philippines develop into typhoons in the China Seas. The point is, whether we are going to display the figures under column 3 or not.

Monsieur Bruzon: You should always err on the side of safety. If you are not certain whether it is a typhoon or a depression you should signal "typhoon" but if you signal "typhoon or depression" you might mislead the captain of the ship.

Mr. Claxton: I am afraid I disagree, as regards misleading the captain of the ship. I quite agree that you should err on the side of safety, and if you think there is danger of a typhoon you would put up the figures under column "typhoon". I should like to repeat that what we want to settle is whether we are going to display the figures of column 3.

Monsieur Bruzon: I think ships without wireless seeing the signal on the mast "typhoon or depression" will get no further information and they may take useless precautions for a typhoon, and on the other hand they may only consider it a depression. When they have got out to sea the depression may have already changed into a typhoon.

Mr. Claxton: If a shipmaster sees the signal "typhoon" he will take precautions accordingly and if he sees the expression "typhoon or depression" he will use his own judgment as to whether he leaves port or not.

Monsieur Bruzon: I should like to ask at what stage a depression becomes a typhoon?

Mr. Claxton: When it develops destructive winds.

Monsieur Bruzon: Destructive winds are not necessarily of the same force for all sizes of ships. For a small ship a wind of small force would be destructive.

Father Froc: I propose to leave the people free to signal in their own way.

Monsieur Bruzon: I repeat that it is well to err on the side of safety, and when there is any question of doubt the onus rests on the observatory if they give a signal which might be misleading.

Mr. Claxton: You are quite prepared to receive remarks from shipmasters who are warned that a typhoon is in a certain position and find fine weather there. Do you not think that is a serious objection?

Monsieur Bruzon: It is very seldom that when we signal a "typhoon" that a ship goes out and finds fine weather. Although he does not necessarily find bad weather he finds some indications of it.

Captain Skinner: If the captain of a ship sees there is a typhoon in existence he may leave port and be guided by his own knowledge as to his future movements.

Lieut. Comdr. Shen and Messrs. Pingjan Tsiang and Sung, stated that they agree to leave column No. 3 optional but are prepared to use that column if they wish to. They do not necessarily tie themselves down to use it.

Mr. Claxton: May I take it that the Conference considers that each Service should be left free to display the symbols of column 3 should they desire to do so, and does not consider this to be contrary to the spirit of uniformity.

Father Selga: I agree with the decision, and think it is true that the spirit of uniformity does not imply the identity of the signals to be displayed everywhere by all Services. We comply with the spirit of uniformity if certain sets of signals are displayed by some centres, although other centres do not feel the necessity or convenience of displaying a certain type of signal. To make it practicable Shanghai

may show only typhoon signals, whilst Hong Kong shown "typhoon or depression" in addition. Uniformity does not mean that Hong Kong and Shanghai must both show "typhoon" or "depression". It is satisfied if the typhoon signals shown in Hong Kong and Shanghai are the same, although certain signals may never be exhibited in Shanghai. I do not think we will break the spirit of uniformity if the Philippines for the present do not adopt the non-local typhoon signals, provided we are willing to adopt them in the future when we are in a position to do so. We show the spirit of co-operation, although at present we do not feel the necessity of a non-local code.

Father Froc: I agree with Father Selga. I consider that I will never use column 3 although I am prepared to use it if I need it.

Since it has been decided by the Conference to keep as before the special sign for Continental Depressions and to show the direction of motion by the points of the compass (line 1 of the Table) there is no need to insist on that point.

The reason for my previous remarks was based on the necessity of keeping the difference between the two kinds of storms, the distinction between both being essential and due to their real constitution, as shown by fog, atmospherics in wireless, and characteristic motions of the seismographs etc. Also there would be great trouble for the sailors to see the directions indicated in different ways. For instance, N.W. corresponding to 28 or 47, 64 or 81, instead of the points of the compass, they all know by heart. Moreover it is not good to communicate with them in a code for "storms" of anticyclones, mostly surrounded with calms, or preceded by blows of wind, for which we have the "gale signals" that are sufficient for all needs.

Since it is understood that the table is drawn for transmission between observatories only, where messages are easily decoded, and not of symbols to be hoisted at semaphores, there is no objection to its admission.

Captain Skinner: The position appears to me to be that Shanghai may hoist the signals indicating a "typhoon exists in, say 20° N 120° E", whereas Hong Kong may hoist (in relation to the same disturbance) a "typhoon or depression exists in 20° N 120° E". This is not uniform, but it seems that we cannot at this Conference bring about uniformity in this particular phase.

After further discussion it was decided to make optional the display on the signal masts of the figures in column 3 of Table 1.

With this reservation, and the inclusion of the original signal No. 9 of Table 3, the Non-Local Code was adopted.

Mr. Claxton: As regards the Local Code we are in agreement as to the insertion of two new signals between signals Nos. 1 and 2 of the Hong Kong Local Code, the new signal No. 2 to be a black horizontal bar indicating "strong winds with squalls may possibly occur from the South West. No. 3 an inverted "T" indicating "strong winds with squalls may possibly occur from the South East"—each Service to determine its own description of the code best suited to local requirements.

You have copies of the code before you and I should be glad to have the remarks of any Delegates thereon.

Father Selga has pointed out the difficulty of maintaining red signals in various ports in the Philippines, and having very generously met us a good deal more than half way, I think Hong Kong should meet him in this, to my mind, comparatively small point. It has always been the custom in Hong Kong, however, to consider the red signal as merely a cautionary preliminary signal; no immediate danger. A black signal at the masthead has hitherto indicated that Hong Kong is threatened by a gale. Formerly the only distinction between a precautionary and a definite warning of a typhoon was one of colour, the shape of the signals being the same. When the Hong Kong Local Code was revised 13 years ago, a red cone point upward was adopted as the precautionary warning and a black cone point upward as signal No. 2 (definite warning).

At a distance it was very difficult to distinguish between signals Nos. 1 and 2 as they were the same shape, although No. 1 was red and No. 2 black. For this reason signal No. 1 was altered from a cone point upward to the letter "T", a symbol not used in the remainder of the code, and I think that the difference between the red cone and the black cone is not so great as the difference between even a black "T" and the other (black) symbols of the code. I thought it my duty to lay the views of Hong Kong before the Conference before taking a decision on this matter. Personally, I am prepared to meet Father Selga on this point and use a black "T" for signal No. 1 instead of a red "T" for the reasons I have already given.

Father Selga: I wish to thank you for meeting our points of view especially taking into consideration that in the Philippines it would be difficult to preserve always in good condition the red signals. There are places, such as Basco, that have mails and ship service only once every three or four months. Rain would very likely erase the paint on the signals, and to my mind signals at a certain distance would not be distinguishable as to colour, and it seems to me that the shape of the signal is more important than the colour. If I understand rightly, it is left free to each Service to print its own explanation of the signals.

Mr. Claxton: That is so.

Father Selga: If we print an explanation in our own form, any sailor arriving in Manila and seeing typhoon signal No. 5 will understand that it means a gale is expected from the North West quadrant.

Mr. Claxton: From a conversation I have just had with Father Selga I find we are not in such close agreement as I thought we were yesterday. Father Selga uses as symbol No. 4 the expression "typhoon dangerous although danger is not yet imminent". This appears to be necessary in Manila because the Manila Observatory gives birth to the typhoons but the Hong Kong Observatory buries them. Hong Kong can usually indicate that a gale may be expected from a certain direction while the typhoon is still perhaps 200 or even 300 miles away; say E.S.E. of Hong Kong: but at Manila the direction from which a gale may be expected is not so apparent until the typhoon has approached within a comparatively short distance of Manila, and it is fairly obvious whether it will pass to the North or to the South. The strongest winds usually occur after the typhoon has passed the meridian of Manila. That, gentlemen, makes the question of uniformity difficult, the conditions in Manila and Hong Kong being different. Father Selga has very kindly consented to preserve in his code our signal "gale expected to increase", which he may not have to use very frequently, if at all, and I am prepared to recommend the Hong Kong Government to insert in the code his signal No. 4. Its position in the code as No. 4 may appear unsuitable to the shipping community of Hong Kong, but it is in its correct place as regards the Manila code. With an explanatory note I do not think that will be a great difficulty. With a view to uniformity I hope that the shipping community of Hong Kong will accept this additional signal in the place indicated.

The proposed signal No. 4 is a black diamond, the only available symbol.

Lieut. Comdr. Dodington asked what the corresponding night signal would be. To this *Mr. Claxton* replied that it would be white, white, red.

The Local Code, as amended, was unanimously agreed to.

Father Selga asked if it is the intention of the Conference to publish the Minutes of the Conference. To this *Mr. Claxton* replied in the affirmative.

Father Selga: Under these conditions I think it would be advisable for all of us to put down a concise statement of the main ideas we wish to convey

There is one problem which I would like to propose to the Conference. There is a growing tendency on the part of some ships, especially non-commercial ships, to construct a weather map on board with local observations and the synoptic messages received by wireless from observatories. The effort is perhaps worth while. However, ships should keep in mind that synoptic observations are broadcast by the observatories only at the times previously announced and published in International

lists. Inasmuch as observatories, on account of other work, cannot afford the time to furnish upon request all observations of the stations under their control at a moment's notice. Perhaps a system could be devised to render the greatest assistance to the ships by sending to Pratas Observatory observations from the different stations, and make Pratas an exchange for any ship which at any time may call for observations.

Lieut. Comdr. Dodington : May I raise the question of Index Numbers for the various stations in the Far East. What do they propose to do about Index Numbers?

Mr. Claxton suggested that both matters be discussed in the afternoon.

The meeting was adjourned at 1 p.m.

(Signed) T. F. CLAXTON.

Sixth Meeting, Wednesday, 30th April, at 2.30 p.m.

Delegates present :—Mr. T. F. Claxton (President), Monsieur E. Bruzon, The Rev. Father Louis Froc, S.J., Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, S.J., Lieut. Comdr. Y. C. Shen, C.N., Mr. S. W. Sung.

By invitation :—Captain R. H. G. Ashby, Lieut. Comdr. A. E. Dodington, R.N., Lieut. A. St. J. Edwards, R.N., Mr. C. W. Jeffries and Captain D. Skinner.

Father Selga proposed the following resolution :—This Conference expresses the hope that masters of ships wishing to draw a weather map may be allowed to apply to the Pratas Meteorological Station for observations from land stations received daily from the various Weather Services in the Far East.

This proposal was seconded by Mr. Claxton and carried.

Lieut. Comdr. Shen promised to give the matter his consideration and endeavour to make the arrangements necessary for carrying out the wishes of the Conference.

Mr. Claxton : Lieut. Comdr. Dodington proposes definite index numbers or letters for reporting stations in the Far East. At present, as he points out, each Service has its own index *letters* for the various stations, whereas in Europe and America stations are allotted index *numbers*. Lieut. Comdr. Dodington would like the opinion of the Conference as to whether we should endeavour to obtain International index numbers for our reporting stations.

Lieut. Comdr. Dodington : I think it would be a great advantage for all observatories who send out synoptics to use the same numbers (or letters) to indicate the same stations. At present Japan uses different letters from Hong Kong. Furthermore, different transmitting stations in Japan have different letters for their own stations, which makes it extremely hard for people who have to draw weather maps on board, because they cannot memorize the station letters. I do not think it matters very much whether letters or numbers are used. In the case of Europe we have two numbers, to which is added a third, to give the International number. England runs from 1 to 100, and a station like Valencia for instance, has the number 01, that is in the British broadcasts, but if you broadcast that internationally another number is tacked on at the beginning and it becomes 101. France has International numbers running from 2 to 300. 209 is Paris. For internal synoptics it would be merely given as 09. We could ask if we could have International numbers given to Chinese stations. Siberia and Russia have their International numbers now, but who is responsible for their allotment I do not know.

Mr. Claxton : We could presumably obtain numbers from the International Meteorological Committee.

Monsieur Bruzon : I think numbers should be used to indicate stations and not letters, as in the International code the first three numbers of the five figure group indicate the station.

Lieut. Comdr. Dodington : In that case we could adopt three figure station numbers.

Mr. Claxton : I propose that the International Meteorological Committee be asked to allot index numbers for reporting stations in the Far East.

Monsieur Bruzon : As numbers are already allotted to European countries, perhaps in these numbers there may be some which should be allotted to their colonies. The first number gives the country to which the colony belongs. In the same way wireless calls contain a letter which indicates the country of origin.

Mr. Claxton : Do you agree that the International Committee should be asked if numbers might be allotted to Meteorological stations in the Far East.

Lieut. Comdr. Dodington : It will be necessary to send the names of the stations.

Father Selga : Will allowance be made by the International Committee for extra numbers for additional stations? If we send five or six definite stations reporting now, we may need more numbers in the future for new stations.

Mr. Claxton : I do not think we are competent to allot any numbers to any new stations.

Monsieur Bruzon : The Meteorological Committee should be able to reserve sufficient numbers to cope with colonial stations. I propose to leave the matter in the hands of the President.

This was agreed to unanimously and Mr. Claxton was asked to communicate accordingly with the International Committee.

Mr. Claxton : In regard to the question of a "Notice to Mariners" I have made the necessary alterations in the existing Notice* which I will now point out to you.

Owing to the different requirements of the various stations it is not perhaps, possible to issue the same notice to mariners from each weather bureau, although the data asked for may be uniform, and I have endeavoured to attain uniformity by the alterations I have made in the Hong Kong notice. The first alteration is in the fifth line of paragraph 2. I have deleted the figures 0300 and 0900 and added "also at 0300 and 0900 when possible". Paragraph 3 is inserted on account of the unsatisfactory behaviour of aneroid barometers. It is not incumbent on all stations to insert that paragraph, but personally I consider it advisable. Paragraph 4 states why I have asked for corrected readings of the barometer instead of the uncorrected readings. The next correction is made in the third line of paragraph 5 in accordance with corrections made in the fifth line of paragraph 2. Then we come to the actual data which I propose should be asked from ships.

Item A, is the ship's name, position, and time of observation G.M.T. I should like to know if any Delegate would prefer this information to be given in any other order.

I should like to know if any Delegate would prefer that information to be given in any other order.

Father Selga : We find it convenient to have the ship's name at the end as a signature. The weather report begins with the position and time of observation; the ship's name is not given first. It is given at the end as a responsible signature to the message. I would also like to state somewhere that the position is to be given in a definite order.

Mr. Claxton : The ship's name may be given last.

To meet the wishes of Father Selga, I have added a note with regard to item B. (barometer). If it is desired to send uncorrected barometer readings the word "uncorrected" should be added. Without that word it is to be assumed that the barometer reading is completely corrected.

Has any Delegate an objection to the words "steady", "rising" or "falling"?

Father Selga: I have no objection but I anticipate that not all observers will comply with them. I think we could not enforce the observers to add this information.

Monsieur Bruzon: How is one going to interpret rising or falling of barometer when the diurnal variation of barometric tide is great.

Mr. Claxton: I suggest that we leave that to the observer who is sending the observations.

Item C. is the temperature of the air. Is it necessary to qualify that in any way, or shall we leave it to the observer to put it in the scale in which the thermometer is read? If it is Fahrenheit it would be entered in the message as Fahrenheit temperature, and if it is Centigrade temperature it would be entered as Centigrade. If it is on the absolute scale it would be entered as such. I think we might leave it to the observer. There is not likely to be any confusion.

Agreed.

Item D. is temperature of the surface of the sea.

Item E. is wind direction and force (Beaufort). Adding when possible, the words, "steady", "veering" or "backing".

Item F. is the state of the sea on a scale of 0-9.

Item G. is direction of swell—N. N.N.E., E. etc., or confused. Also height (low, moderate or heavy).

Item H. is visibility. In the numbers of code VI (b) of the International Code, 1929.

Item I. is state of weather (in plain language).

Example I.

Latitude—17°.10'

Longitude—113.30'

Date, April 29.

G.M.T. of observation. 2200

Barometer 760.5 m.m.

Air Temperature—28 deg. Centigrade.

Surface temperature of the sea 27 deg. Centigrade.

Wind direction—N.E. steady.

Wind Force—3

State of sea—4

Direction of swell—E.

Height of swell—moderate

Visibility 7

Weather—fine with occasional showers.

Ship—"Macedonia"

This message would be received as follows:—

1710,11330 April 29. 2200, 7605. 28. 27. N.E. 3 steady. Sea 4. E. swell moderate. Vis. 7. Weather fine with occasional showers. Macedonia.

Example II

Latitude 14.10
Longitude 116.22
Date. August 2
G.M.T. of observation 0600.
Barometer 28.873 in (uncorrected).
Air temperature 78 deg Fahr.
Surface temperature of sea—not observed
Wind direction—S.W. backing
Wind force—9
State of sea—8
Swell—heavy, confused.
Visibility—0.
Weather—overcast, heavy rain violent squalls.
Ship—“Hai Ning”.

This message would read as follows:—

1410, 11622 August 2, 0600, 28.873 uncorrected 78 xx S.W. 9 backing.
Sea 8 heavy confused swell. Vis. 0. Weather overcast heavy rain
violent squalls. Hai-Ning.

Mr. Claxton: So long as the body of the Notice is uniform I do not think it can matter to sailors in what form the local explanations are given. In the Hong Kong Notice we add an account of the information broadcast by the Royal Observatory and I presume each Weather Service will insert in its Notice information appropriate to that Service.

With regard to data given by each Weather Service I think we should strive for uniformity in this respect also. You will see from the notes before you what is broadcast by Hong Kong. I should like to ascertain what is broadcast by other Services and endeavour, if possible, to come to some agreement on this subject.

Monsieur Bruzon: In the third line of paragraph 1, after the word “ship-masters” the words “shipping companies” should be added, and that ships be requested to send observations to the various observatories via the nearest wireless station.

Father Selga proposed that the Notice should contain barometer reduction tables, with an example in British and Metric units. Also a copy of Code VI (b) of the International Code, 1929.

These proposals were agreed to.

The meeting adjourned at 4.30 p.m.

(Signed) T. F. CLAXTON.

Seventh Meeting, Friday, May 2nd, at 10.30 a.m.

Delegates present: Mr. T. F. Claxton (President) M. E. Bruzon, The Rev. Father Louis Froc, S.J., Mr. Pingjan Tsiang, The Rev. Father Miguel Selga, S.J., Lieut. Comdr. Y. C. Shen, C.N., Mr. S. W. Sung.

By invitation: Captain R. H. G. Ashby, Lieut. Comdr. A. E. Dodington R.N., Captain A. W. Davison, Lieut. A. St. J. Edwards, R.N., Mr. C. W. Jeffries and Captain D. Skinner.

Draft minutes of the fifth and sixth meetings were circulated for revision by Delegates.

Mr. Claxton: Lieut. Comdr. Shen of Pratas Meteorological Station wishes to make the following proposal:—

That short wave should be used for the transmission of weather messages between observatories, in order to minimise interference by atmospherics.

Mr. Pingjan Tsiang seconded Lieut. Comdr. Shen's proposal.

Monsieur Bruzon: I am of the same opinion as Lieut. Comdr. Shen that it is of great importance that transmission from weather bureaus should be, as far as possible, on short wave. It is also of great importance that messages from observatories to each other should be on short wave and not on long wave through a link. I would also emphasise the importance of observatories having their own wireless station by which they can transmit messages at an exact time and are not interfered with by Government or other messages.

Mr. Claxton: I think we are all agreed that short wave is a very suitable method of broadcasting, and of transmitting from station to station our meteorological observations; but, before putting the motion to the vote, I should like to have the opinions of other Delegates on the subject.

Father Froc recommended that private stations should not broadcast unsigned forecasts to ships, and quoted two recent cases of ships which had been misled thereby.

Mr. Claxton: We have no control over broadcasting such meteorological forecasts or weather reports, but if it is the wish of this Conference we might express the opinion that it is undesirable for private stations to issue weather forecasts without a complete signature.

Agreed.

Lieut. Comdr. Dodington: With reference to the use of short wave transmissions I should like to draw the attention of Delegates to one point. Short wave suffers from one disadvantage; each wave length has a "zone of silence", or as we call it a "skip distance". This skip distance varies according to the wave length, but not a great deal is known about it except that it exists. Land stations can generally adjust their wave length to enable most other land stations to receive their messages, but ships on the move often find themselves within the zone of silence of a station which they particularly wish to receive. For instance, Zi-ka-wei's transmission on 23.4 metres is practically unreadable at Wei-Hai-Wei, but quite readable in Japanese ports.

For the purposes of forecasting at Wei-Hai-Wei, which I have to do, it is important that I should be able to receive observations from the Yangtse Valley and other stations to the Westward, and the fact that I cannot rely on getting Zi-ka-wei's synoptic, which contains these observations, makes good forecasting difficult for me. I bring up the point, not with any desire to discourage transmissions which I consider are superior to long wave transmissions in the Far East, but to show a difficulty with which we have to contend, and also to stress the importance, from our point of view, of all stations adopting a short wave, so that in the event of one of H.M. Ships finding herself in the zone of silence of any particular station, she will be able to obtain the data she requires from other stations situated at a more favourable distance.

Mr. Claxton: It is an interesting point to which Lieut. Comdr. Dodington himself has furnished the only solution. That is, if a ship finds she is in a zone of silence for some particular station she should wait, while in that zone, for some other station to send a weather report.

Father Selga: With regard to the main point, I am in favour of the adoption of short wave method in addition to the long wave. The Philippine Weather Bureau is making arrangements for the establishment of a short wave radio set, both transmitting and receiving. It is our intention to use short wave for transmission and reception of observations, both from observatories in the Far East and from ships. I know that all ships are not provided with short wave sets, but the time is perhaps coming when all ships will have it, and when they want information about the position of a typhoon the observatory which has its own transmitting set will be in a position to furnish the ship with the information desired.

Monsieur Bruzon: The short wave wireless at the Philippine Islands will render great service, as during thunder storms and at many other times, due to atmospheric and interference, long wave is practically unreadable.

Mr. Pingjan Tsiang: It would also be of great service to the Tsingtao Observatory if short wave were used, because the majority of our stations have short wave, as also have the Chinese ships which send in reports.

After further discussion *Lieut. Comdr. Shen's* proposal was adopted.

Mr. Claxton: *Lieut. Comdr. Shen* would also like the Conference to ask the Japanese Station at Palau to broadcast 2 p.m. observations at some convenient time. I have already asked the Palau Observatory to do this and the reply was that it was not possible. However, a request from this Conference should carry considerable weight, and for that reason I should like to second *Lieut. Comdr. Shen's* proposal.

Monsieur Bruzon: The wave length used by Palau is 10,000 metres, and in the afternoon this wave length is probably not readable, as atmospheric conditions at that time are very bad.

Mr. Claxton: I would suggest that we might add to *Lieut. Comdr. Shen's* proposal the words "and if possible on short wave".

Lieut. Comdr. Shen: I am fully in agreement with that addition to my proposal.

With this addition the proposal was adopted.

Mr. Claxton: The next subject I wish to bring before you is a note from *Monsieur Bruzon* on the subject of the Non-Local Storm Signal Code. The Code has been adopted, but it is desirable that *M. Bruzon's* note should be discussed. The English and French texts are as follows:—

Dear Sir:

Please find below certain ideas I wish to put before you on the subject of the non-local storm signal code. According to the existing code, when it is stated that the intensity of a typhoon is unknown we mean that we do not know whether the typhoon is violent or not. If it is not, it is only a depression, and moreover a depression of but little importance, for one cannot set out definitely the difference between a depression developing and a typhoon.

2. Thus when we use the term "intensity unknown" we state that the disturbance may be either a true typhoon or a depression. We show that we are in doubt as to the importance of the disturbance. Hence it seems useless to introduce the term "typhoon or depression" in the code.

Cher Monsieur:

Veillez trouver ci-dessous les quelques remarques que j'ai cru devoir vous présenter au sujet du code non local d'avis typhoons.

Dans le code, tel que vous l'avons employé jusqu'à présent, lorsque l'intensité d'un typhon est inconnue nous voulons dire que nous ne savons pas si le typhon est violent ou s'il ne l'est pas. S'il n'est pas violent ce n'est qu'une dépression, et encore une dépression peu importante, car on ne voit pas nettement ce qui peut différencier une dépression creuse d'un typhon.

2. Ainsi lorsque nous employons "intensité inconnue" nous disons tout simplement que le typhon peut être un véritable typhon ou une dépression, nous exprimons notre doute relativement à l'importance de la perturbation. En conséquence il apparaît inutile d'introduire "typhon ou dépression" dans le code.

3. Further, so long as we are certain that we are only dealing with a depression this depression can hardly be violent; otherwise it would be a typhoon. The question arises, is it necessary to signal a depression of minor importance by means of the non-local code? Will it not suffice to mention the existence of such depressions in the meteorological bulletin published daily and transmitted by radio?

4. In my opinion, in respect of the majority of typhoons which cross the China Sea from East to West, we seldom know the conditions near the centre, we cannot ascertain them except from the observations of ships at sea. Yet it is our bounden duty to keep ships clear of such danger areas.

5. On the map an incipient typhoon may present very much the same aspect as a depression, and it may even occur that on the weather map there is less indication of a violent typhoon than of a depression, so long as it is far from the coast.

6. This is what happens in the case of typhoons of small diameter in the Gulf of Tonkin, at the centre of which the fall of the barometer is barely 10 m.m. They are extremely violent and destructive:—the barometric gradient is so steep. This is why I consider it essential that the term "depression" should be used with great caution.

7. Father Selga, with whom I have just had a superficial discussion of this question, has always in mind those low pressure areas in which the barometric gradient is shallow and the cyclonic circulation not well marked, but in which heavy rain may fall and the depression ultimately develop into a typhoon.

8. Would it not be possible to introduce into the non-local code a special symbol to draw the attention of navigators to this type of disturbance.

3. De plus si nous sommes certains que nous n'avons affaire qu'à une dépression cette dépression n'est sûrement pas violente. Autrement ce serait un typhon. La question qui se pose est alors la suivante. Est-il nécessaire de signaler une dépression de médiocre importance au moyen du code non-local? Est-ce que la mention de l'existence d'une telle dépression dans les bulletins météorologiques quotidiens affichés et transmis par radio, n'est pas suffisante

4. En fait et ceci me paraît vrai pour la plupart des typhons qui traversent la Mer de Chine d'Est en Ouest, nous ne savons que très rarement ce qui se passe au voisinage du centre d'un typhon. Nous ne le savons, et nous ne pouvons le savoir que par des observations de navires en mer. Or notre devoir est précisément d'éloigner les navires de tels parages dangereux.

5. Sur les cartes un typhon très creux ou une dépression peuvent se présenter extérieurement sous le même aspect. Bien plus un typhon violent peut se manifester sur les cartes moins nettement qu'une dépression, tant qu'il évolue loin des côtes.

6. C'est le cas des typhons de petit diamètre que l'on trouve dans le Golfe du Tonkin et au centre desquels la baisse barométrique ne dépasse guère 10 m.m. Ils sont extrêmement violents et destructeurs parce que le gradient barométrique y est fort. Tout cela pour dire qu'à mon sens il faut manier le terme "dépression" avec beaucoup de circonspection.

7. Le P. Selga, avec lequel je viens de m'entretenir un peu de cette question, a toujours en vue ces aires dépressionnaires où le gradient est faible, la circulation cyclonique des vents peu marquée mais où il peut pleuvoir abondamment et où ultérieurement un typhon peut se développer.

8. Ne serait-il pas possible d'introduire dans le code non-local une notation spéciale pour ce genre de perturbation et ainsi d'éveiller l'attention des navigateurs?

I shall be very pleased to learn your views on the above points.

(Signed) E. BRUZON.

Je serai très heureux de connaître votre point de vue relativement à qui précède, et vous prie de me croire, cher Monsieur, votre très dévoué,

(Signé) E. BRUZON.

Mr. Claxton: *At the Tokio Conference of 1913 it was decided to introduce into a non-local storm signal code symbols to indicate the degree of intensity of the typhoon; but after prolonged discussion the Conference decided that it would be unsafe to use any but the expressions "intensity severe" or "intensity unknown". Although a typhoon may not appear to be severe on the map, we cannot say what the gradient—and hence the severity of the typhoon—may be within the lowest isobar we can draw.

The signal "intensity unknown" does not mean that the disturbance is only a depression, nor the doubtful case of "typhoon or depression", but a typhoon in which the barometric gradient near the centre is unknown. It is not necessary, nor is it intended to signal "depression" on the map, except the continental depressions which Father Froc deals with, but the column headed "depression" has been introduced for the purpose of telegraphing information concerning depressions by code, instead of by the present cumbersome method.

I agree with Monsieur Bruzon that the term "depression" should be used with great caution. I consider that the term "typhoon of unknown intensity" describes the small typhoons of the Gulf of Tonkin mentioned in paragraph 6 of his note.

I think an explanatory note added to his description of the code would meet Monsieur Bruzon's requirements.

Father Froc: I have not the desire to contest the point with Monsieur Bruzon, but I think his remarks fall into line with my views. The introduction of columns Nos. 3, 4, and 5, or even the single column 3 of table 1 for signalling the direction of storms seems to me regrettable. I do not formally oppose the adoption in view of the assurances given to me by an experienced sea captain of the China Seas, but you must understand that it was reluctantly. It leaves, as has been explained, only a relative uniformity. I would prefer to maintain an absolute uniformity. It is the simplicity of the code which is its strength and which renders its universal adoption possible, even in countries where all those distinctions peculiar to our seas do not exist.

We have considered many hypotheses which have been eliminated for good reasons, both theoretical and practical. It is for very good reasons that we have stopped at the present form which we use in Hong Kong, Indo-China, and all over the China Coast. As Monsieur Bruzon says, each position of centre of storm is accompanied by a formal description not only of its approximate position, but also as to what is known of its intensity. For example, for a radius of 120 miles we have not only symbol 2 "severe typhoon" but also symbol 1 "unknown". It seems to me that is all that is necessary, and the remainder might possibly cause trouble in restraining captains of ships from reading everything at sight without having recourse to a code, and that applies to all seas. To emphasise the sense of the signals one could write on the code instead of the words "severe typhoon" the words "real typhoon" and in addition to the word "unknown" the words "or marine depression" which define precisely the uncertainty which exists as to the exact position and nature of the phenomenon "typhoon or depression". That would satisfy all requirements. "Real typhoon" could replace "severe" for everyone should look on the worst side in the centre of a real typhoon.

For the supplementary information furnished by the signals of the local code by wireless, I am of the same opinion as Monsieur Bruzon, for continental depressions are of a special nature. It is not necessary to reconsider the point because their symbol is being maintained.

Mr. Claxton: In reply to Father Froc, I should like to mention that it is not intended to hoist on the mast the figures of columns 4 or 5. They will simply be used for the transmission of weather reports.

In further reply to Monsieur Bruzon, I think his difficulty is one of language and definition, the word "typhoon" is sometimes misleading. I should like to see the word "typhoon" eliminated from our codes, but in the Far East I am afraid that is impossible. Our difficulty would be lessened if we were to use the word "cyclone" but navigators and others in the Far East have become so used to the word "typhoon" that I am afraid it will have to remain in the code.

Monsieur Bruzon: When the barometric gradient at the centre is unknown, how do you know whether it is a typhoon?

Mr. Claxton: We do not know, but we have to say typhoon because the word appears in the code. The correct expression there would be "cyclone" We may know it is a cyclone but we do not know of what intensity. For that reason the signal "intensity unknown" has been introduced into the code.

Monsieur Bruzon: If by definition a typhoon is something violent, it is illogical to say it is of unknown intensity, because by "typhoon" the intensity is great. Up to the present I have talked of a typhoon of unknown intensity, but have considered it as being either a moderate cyclone or a severe cyclone. I have not talked of a typhoon in the same sense that you have employed.

Mr. Claxton: We are speaking of cyclones of different intensities, but, as you say, strictly speaking when once the word "typhoon" is used you should consider that to be something very severe. It is the usually accepted term for a cyclone in the Far East. If we could eliminate the word "typhoon" from our code I think Monsieur Bruzon's difficulties would disappear, but it is doubtful whether such a step would be advisable. I should like to ask the Marine Superintendents what they think. Whether we should substitute the word "cyclone" for "typhoon". The word "cyclone" is the scientific expression for the actual state of affairs; whereas the word "typhoon" means merely "violent wind". "Cyclone" means a certain circulation of the atmosphere.

Captain Ashby: The expression "typhoon" is always used in Board of Trade examinations at home and is in print in meteorological books which are issued for candidates to study. If we changed the word to the correct term "cyclone" we should then have to get this book altered by the Board of Trade. As far as examinations are concerned the word "typhoon" is definitely used for the Far East.

Captain Davison: The non-local signals I understand are intended particularly for the use of sailors. The fine points about "cyclone" or "typhoon" do not really count as far as sailors are concerned. I do not think it will help sailors a great deal if you add more to the code. The present form has been very satisfactory. What we want to know particularly is whether there is a typhoon. The sailor understands he has to prepare for a strong gale, and "typhoon" is the term which is used on the coast.

Mr. Claxton: I would suggest that we put a note in the code stating that the word "typhoon" has been preserved in the code although it might, with greater accuracy, be called a "cyclone".

Mr. Jeffries: It has just been suggested by Lieut. Edwards that possibly the whole difficulty might be met if in the code we had another term. We have at present "severe" and unknown". We might add another expression intimating that it was uncertain. By putting the word "uncertain" in front of "typhoon" or something to imply that there was a doubt about the intensity, it might meet the case.

Lieut. Edwards: I was very diffident about putting forward a suggestion, not being a Delegate; but my idea was, if "typhoon" or "typhoon of unknown intensity" were a contradiction of terms, it would be more logical to say "uncertain typhoon."

Mr. Claxton: There is no room for the addition of such a word in Table 3. It would have to be used in conjunction with the "radius signals".

Father Selga: I think some of the Delegates use the word "typhoon" according to its etymology. The words "typhoon" and "cyclone" are synonymous. A cyclone may be mild, strong or destructive, and the same definition may be given to "typhoon". I do not agree that a typhoon is essentially a storm of great violence. It seems to me that we should give the words "depression or typhoon of unknown intensity". We cannot eliminate the use of the word "typhoon" in the Far East.

Monsieur Bruzon: I am in agreement with Father Selga, but consider it unnecessary to use the words "or depression" since a typhoon may also indicate a "depression".

Father Selga: In reply to that remark I wish to say that "depression" has a circulation less marked than a typhoon, and its barometric fall is not very low.

Monsieur Bruzon: A mild typhoon must necessarily be the same thing as a depression.

Mr. Jeffries: I really think we are being rather academic. We first heard the matter put in a very terse form by Captain Davison, and he gave me the impression that what sailors are particularly concerned about was the warning of position and the terms of the warning do not seem to be of so much importance as we think.

Captain Davison: That is quite so. Even a depression might be just as awkward for us as a typhoon. To my mind Father Selga has defined the question of a typhoon almost exactly the way a sailor looks at it.

Mr. Claxton: In reply to Father Selga I think if we accept his definition of a typhoon our difficulties disappear. It might perhaps be as well to give a succinct explanation of what we mean by typhoon and cyclone and so preserve in the code a word to which the inhabitants of the Far East have become accustomed, and at the same time use no contradictory terms.

Monsieur Bruzon: If we accept the definition of Father Selga of a typhoon I consider it unnecessary to mention "depression" as well, except in the special case, which Father Selga mentioned, of a depression of large area which might bring rain and in the centre of it a typhoon might develop. I consider that it could be catered for by some special signal in the local code.

Mr. Claxton: The information concerning depressions would be furnished by the observatories, and might be exhibited on the masts by the signal No. 1 of the local code. "A depression or typhoon exists which may possibly affect the locality".

Captain Skinner: I would like to say that from a sailor's point of view in studying meteorology as far as we do a cyclone and typhoon are considered as a revolving storm and the word "typhoon" is just a local name which defines a revolving storm.

Monsieur Bruzon: In temperate regions the term "depression" only is used and this frequently indicates a revolving storm of exactly the same nature as a cyclone which may be very violent.

Mr. Claxton: These remarks have been very interesting and in view of Father Selga's and other Delegates' definition of a typhoon, there is no necessity to alter the Non-Local Code, provided there is a note added to the code to state exactly what is meant by a "typhoon".

Monsieur Bruzon: I am in complete agreement.

Mr. Claxton: I have overlooked a point in Table 3. At present the code contains the word "deepening" and the alteration suggested will introduce the word "deepened" in its place. If we retain the word "deepening" instead of "deepened" the table will be precisely the same as before and you may consider this to be an advantage. I am prepared to let it remain exactly as it stands, preserving not only the same signals, but the same order of the existing code. It is a small matter, merely one of preserving continuity, and if you would prefer the word "deepening" to "deepened" I am prepared to restore it. I should like you to consider, however, the difference between the words "deepening" and "deepened". You can frequently see the depression has deepened but you cannot say at a given moment that it is deepening. If you use the word "deepened" it must of necessity mean there has been some deepening. I think on the whole the word "deepened" is better than "deepening". If we introduce the word "deepened" it means a slight alteration, but only of one word or rather the participle of that word.

We should settle this point before definitely adopting the code.

Monsieur Bruzon: I would prefer the word "deepened" to "deepening" although it is of slight importance.

It was agreed that the column "intensity" should be preserved as in the existing code, except that the word "deepened" should be used instead of "deepening".

Mr. Claxton: May we consider the Non-Local Code, with these amendments is adopted, a note being added to the code stating in what sense the word "typhoon" is used?

Agreed unanimously.

Father Froc proposed the following resolution which was seconded by *Monsieur Bruzon*, and carried.

This Conference emphasises the extreme utility of the China Seas Non-Local Storm Signal Code, as shown by the experience of the past twelve years, and would ask Maritime Weather Bureaus to give this Code due consideration before adopting any form of Non-Local Storm Signal Code.

Father Selga: I wish to bring to the attention of the Conference that the Wireless weather reports received by the various observatories of the Far East reach a considerable total at the end of the year. Their immediate usefulness is to complete and confirm the weather map of the day, to serve as an index of the intensity of the monsoon and to assist in ascertaining the centre of storms.

Once they have served this useful purpose, do they still retain sufficient value to warrant the expense involved in their translation into the international code and in their separate publication *in extenso*?

Pursuant to Resolution XXIX of the International Commission for Synoptic Weather Information, 1928. "The observations reported by radio-telegraphy from selected ships should be published in the daily weather reports to meet partially the need for information for retrospective synoptic charts of the globe".

If they are to be printed at all, for the benefit of students of tropical cyclones and synoptic weather maps, it stands to reason that their publication should conform with the standard and code used by the International Meteorological Committee. Considerable time and money could be saved, without inflicting any detriment to science, if the publication of wireless weather messages would be limited by three conditions. First, no meteorological messages shall be published, when they emanate from ships quite close to land stations. It is difficult to see what useful object is served for instance, by publishing wireless messages from ten ships anchored in Manila Bay, when for all practical purposes the observations of the land observatory are sufficient. The same remark should apply to most of the weather messages of ships plying between Visayas and Manila.

In the French Meteorological Code the instruction is issued that observations should not be reported by radio unless they are made at more than 60 miles from the West Coast of France. (Radio Aids to Navigation, 1929, p.107).

Second, outside the typhoon season, only those messages shall be published that emanate from ships navigating seas the meteorology of which is quite unknown. As far as the Philippines are concerned the Sulu Sea and the Western Pacific would fall in the last group. Third, more generosity should be exercised in the publication of wireless messages coming from ships navigating typhoon weather. However, it should be left to the discretion of the Directors of Meteorological Services to decide which, out of many observations taken during a given typhoon, should be published. In the absence of financial compensation, it is advisable to mention the name of the sending ship as a legitimate means of publicity for the Company and as an expression of appreciation of the co-operation of the officers of the ship.

The expense of printing every year the wireless messages in a separate publication are so heavy that it is to be feared that not all Governments will be willing to appropriate the necessary funds.

To meet this difficulty two solutions are suggested. First, in a way similar to what is done by some Reviews in the publication of bibliographies, each observatory may publish the wireless messages received during the year, at the end of their regular annual publication, in the form of an appendix with independent pagination. Second, a rotation may be established between the meteorological centres of the Far East, whereby every observatory would assume the scientific and financial responsibility of publishing for five years all wireless messages transmitted by ships to all participating observatories. The order of observatories might be arranged according to the date of their foundation, or the number of inhabitants of the region they supervise or may be left to mutual agreement.

Mr. Claxton: I am in favour of this proposal and would ask Father Selga for some suggestions as to how over-lapping should be avoided. It would be useless for different observatories to publish the same observations and I should be glad if Father Selga would suggest a method of avoiding this.

Father Selga: To prevent over-lapping, Manila could send to Hong Kong one year their list of observations obtained from ships. The next year Hong Kong to Shanghai, Shanghai to Indo-China etc. Each year a different observatory can compile a list of observations received from ships.

Mr. Claxton: If each observatory in the Far East is to send a list of observations received from ships it would be very little more trouble to send the observations themselves. It might perhaps be better to arrange for the observatories to send all ships' observations received in one year to a central observatory which would undertake to publish them. The next year they would send their ships' observations to another observatory and so on, so that each year a different observatory would publish all available information from ships. It should be left to the discretion of the observatory to select what should be published. It may receive observations from ships quite close together or near coast stations. In such cases a selection would be made for publication.

Father Proc: I agree with what Mr. Claxton says. It is better to have each year one centre to cover all the observations because if each observatory publishes all the messages it has received, out of ten messages the same will be published, say, six times.

Monsieur Bruzon: I consider Mr. Claxton's proposal very reasonable. The observations from ships in the published form would be of great interest. Only last year I was discussing the matter with the International Meteorological Committee.

After further discussion it was decided to ask Central Observatories in the Far East to publish all observations received from ships by wireless telegraphy in yearly rotation.

The observations collected in each year to be sent to the observatory undertaking the publication of that year's observations.

- (a) It is desirable that no observations should be published from ships in the vicinity of a land station.
- (b) Except during the typhoon season, only those observations should be published which emanate from areas the meteorology of which is very little known.
- (c) Observations made by ships in typhoon weather should be printed in greater detail than at present and due recognition be given to observers.

Lieut. Comdr. Dodington: May I, on behalf of the service I am representing, earnestly request that observatories in the Far East which broadcast synoptic messages will include in these messages any ships' reports that they may receive. I suggest that ships' reports should follow the normal station reports, the form being preceded by the word "ships". As to whether ships' reports sent in *en clair* should be coded or not, prior to inclusion in a synoptic message and if so in what code, is, I suggest, a matter for discussion.

Mr. Claxton: We have settled the manner in which ships are to be asked to send observations to the observatories. I think it would be advisable, if we are to include these messages from ships, to transmit them in the same code as is used for transmission of synoptic messages.

Lieut. Comdr. Dodington: It would entail re-coding at the observatory.

Mr. Claxton: If ships' observations are sent out in the manner in which they are received it will make the message too long, because it is almost an *en clair* message which we receive from ships. It would add very considerably to the length of the synoptic, and the time of transmission would exceed the time allowed for such messages. I think, therefore, if we are to add them to our synoptics they should go in the same form as the synoptic.

Monsieur Bruzon: For sending messages we have adopted the Copenhagen Code, in which stations are indicated by three numbers. If it is necessary to send observations from ships in the same code Latitude and Longitude have to be given, and this is not catered for by the code. Some other code, for example the ship's code, or even a simpler code would have to be used.

Lieut. Comdr. Dodington: I have here the two codes adopted at Copenhagen for ships' reports. One of them contains seven groups and the other six. I suggest that four groups would meet present requirements, which include wind direction and force, present weather, barometer, visibility and temperature of the air.

Mr. Claxton: That is making complications, the first group contains "P", the day of the week, and "Q", the octant of the globe, as well as the latitude. For a universal code the octant of the globe is necessary, but not for the purpose we are discussing.

Lieut. Comdr. Dodington: It is a question of whether you think it is advisable to adopt the Copenhagen Code to suit your own needs by substituting other elements for "P" and "Q" in the first group.

Mr. Claxton: I suggest that we adopt in principle *Lieut. Comdr. Dodington's* proposal to include ships' observations in our synoptics, leaving details to be worked out as soon as possible, by correspondence.

Agreed.

Lieut. Comdr. Dodington: I should like to take this opportunity of recording the debt of gratitude H.M. Ships of the China Fleet owe to the Directors and Staffs of Weather Services in the Far East, for the assistance they so willingly give at all times, without which we could not hope to achieve much.

It has always been important that men-of-war should know what weather they are likely to encounter, but the advent of aircraft as a unit of the Fleet has made it imperative that H.M. Ships should study meteorology much more closely than was necessary formerly. Lack of experience of local conditions is a serious handicap, and I trust that you, gentlemen, will continue to give the officers of H.M. Navy who study meteorology the benefit of your vast experience, and that the close co-operation which exists between the Navy and the shore Weather Services will continue, to the mutual advantage of both.

Mr. Claxton: I thank Lieut. Comdr. Dodington for his remarks and think I can promise on behalf of this Conference that Services in the Far East will continue to do all in their power to assist navigation in these regions. I should like to emphasise the fact that the more observations we obtain from ships the more information we shall be able to give them and at more frequent intervals.

In reply to Mr. Claxton no Delegate proposed any further subject for discussion.

Mr. Claxton: We have to settle the date on which the new Storm Signal codes should come into force.

After discussion it was recommended that they should come into force on March 1st, 1931, if the necessary arrangements could be made by that date.

It was agreed that the codes should be named:—

1. Local Storm Signal Code.
2. Non-Local Storm Signal Code.
3. Six-Letter Code, for the transmission of weather telegrams by cable.

Adopted at a Conference of Directors of Far Eastern Weather Services, Hong Kong, 1930. Adding the words "for use throughout the Far East" should Japan agree to use the codes.

Mr. Claxton: Gentlemen, I think I may say that we have now brought this Conference to a successful termination.

The agenda was short, so short that a member of the Colonial Secretary's Office suggested that the questions at issue might be settled by correspondence, that a Conference appeared unnecessary. The answer to that suggestion, gentlemen, is to be found in the minutes of proceedings of this Conference, which have been circulated daily.

The language difficulty has been great and I feel that the Chinese Delegates have been at a disadvantage in this respect, in spite of the Chinese interpreter, to whom I am duly grateful. I fear they have not always understood the discussions completely. The task of interpreting technical discussions is not easy. They will have the opportunity, however, of expressing their views in the final Minutes.

We have adopted the amended Six-Letter Code for the transmission by cable of daily weather telegrams and in this connection I will read to you the following telegrams:—

Claxton to Okada Observatory Tokio: "Regret no representative available, would you supply daily telegrams from land stations at 4 or alternatively 2 international hours if other services willing. Very important. Would you also include temperature".

Claxton Royal Observatory Hong Kong: "Refrain definite answer but coming inauguration of Loochoo wireless will give satisfaction".—OKADA.

Dr. Okada's reply leads us to hope that when the projected broadcasting station at one of the Loochoo Islands comes into operation temperature will be included in the synoptic messages from that station. It also leads us to hope that the observations will be taken at the hours adopted for China and the Philippines.

We have adopted as a Non-Local Code for Storm Warnings the existing China Seas Storm Warning Code, with some minor alterations which I think will be found beneficial.

For a Local Code we have adopted a combination of the Manila and Hong Kong Storm Warning Codes, thanks to the concessions made by Father Selga. I may add that, subject to the approval of my Government, I have also made concessions.

We have decided upon the data to be asked for from ships and the form in which it is to be transmitted.

I regret that, owing to the absence of Delegates from the Japanese Empire and Malaya, it has not been possible to deal with the subject of overlapping in synoptic broadcasts.

I think you will agree with me that we should not close this Conference without thanking the Cable Companies for their great assistance to the cause of Meteorology in the Far East. I propose, therefore, the following resolution and suggest that a copy be sent to the Superintendents of the Cable Companies in Hong Kong, for transmission to their Head Offices.

"This Conference requests the President to convey to the Superintendents of the Eastern Extension and Great Northern Cable Companies the expression of its grateful thanks for the great services they have rendered to the cause of Meteorology in the Far East. It notes with much satisfaction the increased promptness and regularity of this service in the past few years, and the continued accuracy of transmission".

Agreed.

I should also like to congratulate the National Research Institute of Meteorology, China, on its organisation. The publications of the Nanking Observatory show that great progress is being made and I trust that before long we shall be receiving observations from stations in districts at present unrepresented, and so increase considerably the accuracy and utility of our weather maps.

The Foreign Delegates desired to associate themselves with Mr. Claxton's remarks.

I wish to thank Lieut. Edwards for his assistance as French Interpreter, and mention the very hard work put in by Mrs. Evans and Mrs. Nolloth, which has contributed in no small measure to the success of the Conference.

Father Proc: Mr. President: On behalf of the Delegates to this Conference I would ask you to convey the expression of our grateful thanks to The Officer Administering the Government of Hong Kong (the Hon. Mr. W. T. Southorn, C.M.G.) for the honour His Excellency has done us in presiding at the opening Meeting, and for his great kindness and hospitality during the Conference.

Please accept our thanks for your initiative in suggesting the Conference and for inviting us to attend. Also for the able and competent manner in which you have conducted the Meetings. The matters for consideration you have laid clearly before us, and guided the discussions with a tact which has maintained a peaceful and friendly atmosphere, in the face of difficulties and divergence of views.

If the Conference has been a success it is due in great measure, to your direction.

Gentlemen, let us congratulate ourselves on the result for which we have worked, not infrequently very hard. Also for the spirit of union and courtesy which has characterised the Meetings from the beginning to end. Let us hope our deliberations will be of great benefit to all, especially the sailors.

Let us render thanks to those who have given such useful help to the Conference as interpreters, Lieut. Edwards and Mr. Dou Lun, and let us not forget those silent and devoted helpers, Mrs. Evans and Mrs. Nolloth, without whom we could not have had the discussions set so plainly before us. Their skill and promptitude have been much appreciated. Shorthand does not mean short work, and we know that each day while we have been resting from our labours they were working far into the night, or even morning.

Mr. President, I thank you on behalf of the Delegates to this Conference.

Mr. Claxton: Thank you, Father Froc.

The Conference closed at 1 p.m.

(Signed) T. F. CLAXTON.

APPENDIX 1.

Suggestions by Dr. C. W. B. Normand, Director General of Indian Observations, regarding possible generalized modifications of the International System of Storm Warnings, to meet the needs of tropical countries.

India Meteorological Department,

Poona 5, the 15th January, 1930.

The existing International system of visual signals is based upon the needs and practice of central European countries. It has not yet been adopted in all European countries, Britain being a notable case in point. It tells the directions from which gales are likely to begin but depends upon unsatisfactory additional signals (flags) to convey an idea as to whether the wind is likely to back or veer. One cannot deny the fact that it is possible to use the International system even in regions of tropical cyclones, but with far less ease and suitability in India at least than the present Indian system.

I cannot speak definitely for India, since, although this department gives the orders about hoisting and lowering of signals, it does not provide or maintain the signals; that is a duty of the various provincial Governments. One can be fairly certain however that alternative (a) of the following four alternatives will not be accepted in the near future in India. *viz.* :—

- (a) to accept the International system as it stands,
- (b) to increase the number of its signals, (Table B).
- (c) to make it more elastic or (Table C).
- (d) to ignore the International and retain our own Indian system, possibly in a simpler form than the present.

Suggestions as to how alternatives (b) and (c) could be given effect to are shown in the enclosure to this letter. In a discussion that I had in Bombay last year, suggestion (b) was favoured, but in a special committee meeting at Calcutta representing marine interests there the suggestion (d) was favoured, on the ground that visual signals were now of importance mainly to small ships, and were therefore a national, not an international, matter.

I imagine that there will be difficulties in arriving at a unanimous decision for some common procedure for visual signals throughout the China Seas. Just as you wished for general acceptance of the Hong Kong Signal Code, so I should be glad to see the Indian system adopted in the China Seas! That is too much to hope for. But I would ask you to examine the suggestions (b) or (c), either of which may form a basis on which agreement may possibly be attained.

If agreement were reached in the China Seas on the lines of (c), then it might be possible later to get the International Meteorological Conference to recognise a few general principles, such as

Local Gale Warnings.—One or two cones only shall be used to denote that a gale is expected locally.

Local Cautionary.—One or two balls only shall be used to convey warnings or denote the existence of atmospheric disturbances in the neighbourhood of the station, and to advise mariners to be alert and on the look-out for further information.

Distant Storm Signals.—Cylinders only shall be used to denote a distant disturbance to which ships may be exposed after leaving the port: below the cylinder may be hung locality signals, according to local requirements.

On these principles, the present international system would still continue in use without change in Europe.

We in India and you in Hong Kong use a “great danger” signal. I have often doubted and remain doubtful whether “danger” and “great danger” signals are both necessary, but the Calcutta Port authorities last year indicated their wish that both be continued. On the hoisting of the danger signal they always took certain precautions which were considerably increased when “great Danger” was signalled.

(Signed) C. W. B. NORMAND

TABLE A.—INTERNATIONAL SYSTEM OF STORM SIGNALS.

Name	1. Cautionary.	2, 3, 4, 5. Gale Warnings.	Wind Changes
Meaning	Atmospheric disturbance, be alert and look out for further information.	Gale is expected locally commencing with wind in the following quadrants.	The wind is expected to veer. One flag of suitable colour.
			The wind is expected to back. Two flags of suitable colour.
		2. NW. 3. SW. 4. NE. 5. SE.	
Signal (Day)			

TABLE B.—POSSIBLE ADDITIONS TO INTERNATIONAL SIGNALS TO SUIT NEEDS OF TROPICAL COUNTRIES.

6, 7, 8, Tropical Cyclonic Storm Signals.

Severe weather is expected locally on account of a cyclonic storm that is likely to cross the coast.

6. to N* of the port. 7. to S** of the port. 8. Over or near to the port.



*or to W where coast lies E and W.

**or to E where coast lies E & W.











TABLE C.—POSSIBLE GENERALISED MODIFICATIONS OF INTERNATIONAL SYSTEM.

<i>Local Cautionary.</i>	<i>Local Gale Warnings.</i>	<i>Distant Storm Signals.</i>
One or two balls only shall be used to denote existence of atmospheric disturbance in neighbourhood of station, and to advise mariners to be alert and on the look out for further information.	One or two cones only shall be used to denote that a gale is expected locally.	Cylinders only shall be used to denote a distant disturbance to which ships may be exposed after leaving the port. Below the cylinder may be hung locality or other signals according to local requirements.

Remarks.

If some such general principles are laid down and generally accepted, the present international system would still continue in use without change in European countries, while tropical countries could apply the principles as best suited to local requirements.

TABLE D.—INDIAN STORM WARNING SIGNALS.

<i>Distant Signals.</i>		<i>Local Signals.</i>	
<i>Cautionary.</i> There is a region of squally weather in which a storm may be forming.	<i>Warning.</i> A storm has formed.	<i>Cautionary.</i> Threatened by squally weather.	<i>Warning.</i> Threatened by storm but danger not yet sufficiently great to justify extreme measures of precaution.
			
		<i>Danger.</i> Severe weather from storm crossing coast (1) to south of port (or east in some cases).	<i>Great Danger.</i> Severe weather from storm of great intensity crossing coast (1) to south of port.
			
		(2) to north of port.	(2) to north of port.
			
		(3) Over or near to port.	(3) Over or near port.
			

N.B.—At many ports additional signs are hoisted below the above as *locality signals* to indicate the position of the disturbance.

APPENDIX 2.

Letter from the Marine Superintendent of the Canadian Pacific Steamships, Limited.

Hong Kong, 15th April, 1930.

The Director,

Royal Observatory, Hong Kong.

Dear Sir,

I am in receipt of your letter of yesterday's date, and have looked through the various tables sent me. In my opinion they are very well adapted to meet conditions in the Far East. As a matter of fact, I took up the question with Captain Holland of the "Empress of Russia", and we came to almost the same conclusions as yourself.

What I consider a great improvement is your proposal with respect to the time of the signal (Table 4), to show the time when a typhoon or depression was in the position indicated, instead of the time when the signal was displayed.

To prevent overlapping I think it would be a good thing if the various stations broadcasting could so arrange that there would be two or three hours interval between them; i.e. Manila, say at 8.00 a.m., 8.00 p.m. Hong Kong 10.00 a.m., 10.00 p.m., Shanghai Noon, Midnight, Formosa 2.00 a.m., 2.00 p.m., Japan 5.00 a.m., 5.00 p.m., all Standard 120 Meridan time. The advantage of this arrangement would be such that no two stations would be sending simultaneously. If a vessel was in communication with two or three stations at once, she would have more frequent reports, and this would be exceptionally useful when nearing the path of an approaching typhoon.

I believe an International Code for the whole of the Far East should prove of benefit to ships. The present Japanese system is practically useless, unless the ship is supplied with special Japanese storm warning charts. The system as recommended by you can be used in conjunction with ordinary charts, which makes it comparatively simple to mariners.

When the "Empress of Asia" comes into port on Thursday next, I will try and arrange a discussion on the subject with the Commander and one or two of the senior officers, with a view to getting their ideas in the above connection.

Yours truly,

(Signed) W. DAVISON.
Marine Superintendent.

APPENDIX 3.

*Letter from the Marine Superintendent of The Indo-China Steam Navigation Company,
Limited.*

Hong Kong, April 22, 1930.

T. F. Claxton Esq.,

Director,

Royal Observatory.

Sir,

I beg herewith to acknowledge yours of the 14th inst., together with copy of proposed Non-Local Storm Signal Code, and copy of Local Storm Signal Code (1930).

In reply to your request for my views I have pleasure in submitting the following.

Table I. Columns 1, 2, 3. I am of opinion that the figures here shown should be exhibited in Hong Kong. There can be no question regarding columns Nos. 1 and 2. Column 3 may be open to discussion in so far as displaying these signals in Hong Kong, but as they convey important information, I consider they should be shown.

I do not, however, see the necessity for displaying signals as in Column 4 in Hong Kong an anticyclone, though of high importance from a Meteorologists view point is not so important from the Shipmaster's or public standpoint.

Table II. This, I consider also necessary with the exception of figures in "Anticyclone" column, which I think need not be exhibited in Hong Kong. I am of opinion this table should be additional and not alternative to Table I.

Table III. My remarks for Table II apply here also.

Table IV & V. Should be used and displayed at Hong Kong.

As regards the sending out of above signals by Radio, I consider the system as outlined by you should meet the case fully, and make for greater brevity than exists at present. It is as simple as it can be, while at the same time conveying all necessary information.

Most ships have wireless but some do not, and insofar as the displaying of signals is concerned in Hong Kong, I consider the more meteorological information displayed the greater the benefit to the community, particularly Shipping Companies and Shipmasters and these I have chiefly in mind in forming my conclusions. As previously stated, however the displaying of Anticyclone signals is, I think, unnecessary in Hong Kong but certainly should be Radioed.

Local Storm Signal Code (1930). I am glad to note that day and night signals are to be displayed at Gough Hill, Police Station and near the Field Officers' Quarters at Lyemun. I think this is a beneficial step. This code, as it stands I consider to be all that is needed.

Yours faithfully,

(Signed) D. SKINNER.

Marine Superintendent Indo-China S. N. Co., Ltd.

APPENDIX 4.

Letter from the Marine Superintendent of Messrs. Butterfield & Swire.

Hong Kong 1930 April 24.

T. F. Claxton Esq.
The Director,
Royal Observatory,
Hong Kong.

Dear Sir.

I beg to acknowledge receipt of your favour of the 14th inst. with proposed Storm Signal Codes attached.

Having perused same very carefully and studied them with the existing codes I am of the opinion that your proposals are very sound and if adopted should at once wipe out the many misunderstandings that arise with so many different codes used in the Far East. I note you propose the adoption of the existing Hong Kong Code for Local Storm warnings. I would like to point out the difficulty experienced by Ship Masters when anchored in Kowloon Bay during the near approach of a Typhoon which is to pass over or near the Colony to read the Storm Signals at the Signal Station, because an hour or so before the actual Typhoon strikes the Colony it is preceded by violent rain squalls and the Signal mast is obscured and one at anchor in Kowloon Bay cannot know the exact position of Typhoon, unless Wireless Operator is on board and even if he is, it is at times impossible to get into communication, so I would suggest that an additional Signal mast should be erected at a nearer point to Kowloon Bay (East end) to enable a Shipmaster to see Storm Signals to the last and final signal.

Wishing you every success in the forthcoming conference and regretting my delay in answering.

Yours faithfully,

(Signed) R. ASHBY.
Actg. Marine Superintendent.

APPENDIX 5.

Letter from Monsieur le Chef du Service Météorologique de l'Indochine.

Directeur de l'Observatoire Central.

Monsieur le Directeur
de l'Observatoire Royal
de Hong Kong.

Phu-lien, le 14 Avril, 1930.

Monsieur le Directeur,

J'ai l'honneur de vous accuser réception de votre dernière lettre reçue le 1er avril dernier et les documents annexés.

Je crois devoir vous faire connaître que j'ai reçu tout récemment un exemplaire du code météorologique international élaboré à Copenhague en 1929 et que le Ministère des Colonies, Paris, insiste pour que son utilisation intégrale ou partielle

soit envisagée en Extrême-Orient. Il est certain, en effet, que les codes employés jusqu'à présent sont manifestement insuffisants eu égard aux besoins de l'aviation. En présence des demandes de renseignements de jour en jour plus nombreuses qui me sont adressées par l'Aéronautique d'Indochine, j'ai déjà été amené à faire figurer, dans les météogrammes des stations du réseau indochinois, un certain nombre d'éléments qui n'y figuraient pas auparavant; en particulier, la nébulosité du ciel inférieur et la visibilité dont il n'est pas possible de se passer. Mais ce n'est pas encore suffisant et j'estime qu'un code plus complet s'impose.

En ce qui concerne la pression barométrique, il me paraît indispensable de faire figurer la variation barométrique en 24 heures dans les messages. C'est un élément de contrôle important.

Pour ce qui est de l'humidité, il est certain qu'un état hygrométrique élevé accompagne toujours un "brouillard épais", mais la réciproque n'est pas vraie, et il n'est peut être pas indiqué de supprimer cet élément.

D'une façon générale, je crois qu'il sera opportun de soumettre à la Conférence de Hong Kong l'adoption tout au moins partielle du code de Copenhague pour transmission des météogrammes en Extrême-Orient.

Je crains fort de ne pas arriver à Hong Kong en temps utile pour assister à la séance d'ouverture de la Conférence. Le bateau sur lequel je dois voyager n'arrivera en effet à Hong Kong que vers 10 heures s'il n'a pas de retard. Je vous demanderai le cas échéant de vouloir bien m'excuser.

Par ailleurs, je serai très heureux s'il vous est possible de me faire réserver une chambre au Hong Kong Hotel. D'avance, je vous remercie de votre extrême amabilité.

J'assisterai également avec grand plaisir aux diners des 28 avril et 2 mai, ainsi qu'à l'excursion à la station magnétique d'Au Tau.

Veillez croire, Monsieur le Directeur, à mes sentiments tout dévoués.

(Signé) E. BRUZON.

APPENDIX 6.

Letter from the Coast Inspector, Chinese Maritime Customs, Shanghai.

1930, April 14.

Sir,

I beg to acknowledge receipt of your communication dated 2nd March, in connection with certain proposals relative to meteorological matters in the Far East to be discussed at the forthcoming conference at Hong Kong.

As I have already advised you, it will not be possible for me to attend the meeting owing to shortage of staff, etc., so I now record my views on the matter in writing.

I preface my remarks by pointing out that the Chinese Maritime Customs is not directly connected with the major part of the proposals under discussion, which are intimately connected with the several observatories in the Far East.

Generally speaking the Maritime Customs partakes in meteorological matters only to the extent of providing the observatories with records of weather conditions from some forty four land stations and seventeen light stations.

We receive no telegrams or reports from shipping and we broadcast nothing meteorological to the public.

I also point out that I am not an expert in meteorology and therefore the observations I have to make must be taken for what they are worth.

My views are as follows:—

Q. Are ships operating in the Far East to be asked to observe at international hours? and, if so, will land stations also observe at these hours?

A. So far as ships are concerned I am of the opinion that no authority in the Far East can impose any time or method of observing on the Commanders of vessels. It would be pertinent, however, to extend an invitation to the shipping companies to do so, and the Customs Service would be prepared to associate itself with such a proposal if approved by the Congress.

In respect to land stations, our observations for meteorological telegrams are made at 6 a.m. and 3 p.m. China Coast time. The object in selecting these hours was in order that the observations should be taken, if possible, by a foreigner, thereby insuring accuracy. We do not take observations during the night because there would be no foreigners available, and observations taken during this period would be handled by Chinese, who are not trained sufficiently to insure that readings taken by them are accurate; and there would be no facilities for sending telegrams, which must be coded by a foreigner. If, however, the Congress should so desire I am prepared to recommend to the Inspector General of Customs that we alter our hours of observation to 00h and 06h G.M.T. (8 a.m. and 2 p.m. China Coast Time) thus conforming to two of the times recommended.

Q. Are ships operating in the Far East to be asked to send their observations in one of the two codes adopted at the Copenhagen Conference. If so, which? Alternatively, should ships be asked to send their observations *en clair*, as at present.

A. I am of the opinion that it is preferable to send the messages *en clair* as now. If the messages were composed by the Commanders or well trained officers there would be no objection to the use of the code, but it is considered that many of the vessels operating on the coast, such as coasting vessels, cargo steamers, etc., have not the necessary staff to undertake the coding of messages. This matter does not affect the Customs, for, as already stated, we receive no meteorological messages from ships at sea.

Q. Concerning visibility, humidity, types of weather (page 2).

A. I consider that the present form used by the Customs for transmitting meteorological telegrams by means of five figure groups (the number permitted to be sent free by the cable companies) gives all the information necessary. It is to be noted that visibility is easily deducted from the state of the weather in our code (see pages 10-11 of "Instructions concerning Meteorological Work" published by the Customs, copy of which is enclosed). It will be noted that Customs telegrams give the readings of the wet and dry bulb thermometers from which humidity can be found.

Q. Cloud observations; remarks concerning (page 3).

A. It will be noted that cloud condition is now provided for in the Customs telegrams under "Weather" and I see no reason for change in this connection.

Q. Overlapping in synoptic broadcasts suggestions requested.

A. This matter seems to concern the observatories.

In connection with the proposed Storm Signal Code for the Far East. It is pointed out that such a code in the same form was inaugurated at Customs Storm Signal Stations in 1918, not in 1920. Animadverting on the present code I note that it seems it has served its purpose well, and by now it is well known to mariners. If, however, the Conference should consider it desirable to make the changes in the code suggested by you, I am prepared to recommend to the Inspector General of Customs that we issue to our station copies of the tables you have drawn up. The symbols remain the same, and therefore no extra expense will have to be incurred by the Customs.

In conclusion I would say that I have talked these matters over with Father L. Froe, Director of Sikawei Observatory, and as this gentleman will attend the conference he will have a full knowledge of my views on the various points to be discussed. Generally speaking the Chinese Maritime Customs are desirous to do what they can to assist meteorological matters in the Far East, but it must be remembered in this connection that our staff available to take meteorological readings is limited, and they are not trained observers. It should be noted also that our foreign staff is likely to decrease in the future, and we shall have to depend more and more on the Chinese for taking observations. These employees naturally, so far, have little or no experience, and until they are trained it is highly desirable that our share in assisting observatories with the weather conditions should be as simple as possible. Even as things now stand you have had on more than one occasion to draw my attention to mistakes in coding, and it is desirable from the Customs point of view that the method now used by us in observing for and transmitting meteorological telegrams etc., be changed as little as possible, and that the Service is not involved in any additional expense.

Yours faithfully,

(Signed) H. E. HILLMAN,
Coast Inspector.

APPENDIX 7.

Proposals of Messrs. Cochin Chu and Pingjan Tsiang.

Nanking, 19th April, 1930

The Director,
Royal Observatory,
Hong Kong.

Dear Sir,






We beg to acknowledge the receipt of your kind letter of recent date enclosing therewith a copy each of Hong Kong Local Storm Signal Code, a proposed letter code for weather telegrams, and a Draft Programme of the forthcoming Conference. With regard to the questions you raised in your letter we beg to state our opinion item by item as follows:—

1. It seems to us that the morning hour (6 a.m. 120 M.E.G.) adopted for synoptic observation in customs and other land stations are much too early, for it would mean that the observer has to make readings at 5 a.m. in places like Chengtu, and 4 a.m. (120 M.E.G.) as standard hours for synoptic observations on sea, i.e. 00, 06, 12 and 18 (T.M.G.).

2. The two codes adopted at the Copenhagen Conference containing 7 and 6 groups of 5 letters are quite complicated and probably very few steamers plying along the Chinese coast are ready to report them, so we believe the coastwise steamers be asked to send their observations *en clair*, while the ocean liners can report the 6 and 7 group if they so wish.

3. With regard to your proposed letter code for the transmission of weather telegrams throughout the Far East, we agree with you on the principle in the main, but would like to add the following modifications:—

(a) The symbol for the sixth letter should be changed as follows:—Clear

 partly cloudy  cloudy  overcast . The symbol you use for overcast  is objectionable, being identical with the symbol for solar halo.

(b) We prefer to designate the coded time from 1 hour to 24 hour and coded letter from, A.B.C. V.W.X.

(c) The letter code should be used only by marine or island stations, where cable transmission only is feasible, for land stations we prefer the number code, for which we have adopted a code of 5 groups of 5 numbers each, to be used universally among land stations in China during a recent conference of Chinese Meteorological Organisations held in Nanking. The five groups are arranged in the following order:—

BBBDD, FwTTH (orT'). NAdMM (mm). WRRzV. cbbd'h.* The first two groups are obligatory, the last three optional.

Enclosed please find a code adopted at the Nanking Conference.

We expect to sail from Shanghai on April 24 on S.S. "Tsjisondari" (China-Java-Japan Line), which should reach Hong Kong by the 27th and please reserve for us, double room or two single rooms at the Hong Kong Hotel.

Yours faithfully,

(Signed) TSIANG PINGJAN,
Director of Tsingtao Observatory.

(Signed) COCHIN CHU.
Director of Institute of Meteorology.
Nanking.

Weather Codes.

(1) Wind Direction	(2) Wind Force	(3) State of Weather
02.....NNE	0=0-1 <i>Beaufort</i>	0.....Blue
04.....NE	1=2	1-2.....Blue & Cloudy
06.....ENE	2=3	3.....Cloudy
08.....E	3=4	4.....Overcast
10.....ESE	4=5	5.....Rain
12.....SE	5=6	6.....Snow
14.....SSE	6=7	7.....Fog
16.....S	7=8-9	8.....Haze
18.....SSW	8=10	9.....Thunder
20.....SW	9=11-12	
22.....WSW		
24.....W		
26.....WNNW		
28.....NW		
30.....NNW		
32.....N		
00.....Calm		

* c=tendency of barometer during the last 3 hours before observation.
bb=amount of pressure increase or decrease during the same interval.
d'=days of the week (0=Sunday, 1=Monday, etc.).
h=hour of observation.

(4) Relative Humidity	(5) Cloud Form	(6) Cloud Direction
0.....95-100	1—Cirrus-Ci	0 without movement
9.....90-94	2—Cirro-Stratus-Ci. St.	1.....NE
8.....80-89	3—Cirrus-Cumulus Ci. Cu	2.....E
7.....70-79	4—Alto-Cumulus-A. Cu	3.....SE
6.....60-69	5—Alto-Stratus-A. St.	4.....S
5.....50-59	6—Strato-Cumulus St. Cu	5.....SW
4.....40-49	7—Nimbus-Nb.	6.....W
3.....30-39	8—Cumulus or Fracto	7.....NW
2.....20-29	Cumulus-Cu. Fr. Cu	8.....N
1.....10-19	9—Cumulo-Nimbus. Cu. Nb.	
	0—Stratus or Fracto	
	Stratus-St. or Fr. St.	



(10) Visibility Distance Visible.	(7) Past Weather.
0.....	0.....Fair or Fine
1..... 100 metres	1.....Cloudy
2..... 200 „	2.....Overcast
3..... 500 „	3.....Fog or Mist
4..... 1,000 „	4.....Thick Fog
5..... 2,000 „	5.....Passing showers
6..... 6,000 „	6.....Rain or Drizzle
7.....10,000 „	7.....Snow or Sleet
8.....20,000 „	8.....Hail, or Rain and Hail
9.....50,000 „	9.....Thunderstorm

(8) Precipitation.	(9) Time of Commencement of Precipitation
00.....No rain	0.....No rain
01.....0.1-1.0 mm	1.....0 to 1 hour before time of obser-
02.....1.1-2.0	..... vation.
03.....2.1-3.0	2.....1 to 2 „ „ „ „
04.....3.1-4.0	3.....2 to 3 „ „ „ „
05.....4.1-5.0	4.....3 to 4 „ „ „ „
06.....5.1-6.0	5.....4 to 5 „ „ „ „
.....	6.....5 to 6 „ „ „ „
10.....9.1-10.0	7.....6 to 7 „ „ „ „
20.....19.1-20.0	8.....8 to 10 „ „ „ „
30.....29.1-30.0	9.....Above 10 hours
.....	.....No observation.
95.....95-96	
96.....96-97	
97.....98	
98.....98-99	
99.....100 or above	

APPENDIX 8.

Note by the Rev. Father Froc S.J. on Local Storm Signals.

Table A of Appendix 1. When non-local signals are adopted in the harbours of the China Coast, my opinion is to act in conformity with International practice as much as possible, provided there be two different masts, one for the local and one for the non-local or distant signals.

No. 1 The ball  is acceptable for uniformity; however, if I had been at the Conferences of Directors in Europe, knowing the experiments made by Capt. W. F. Tyler on distinctness, I should have proposed another symbol, for instance No. 1 of our code 

Nos. 2, 3, 4, 5 all right, it being advantageous to the navigators to see the same symbols, with the same meaning everywhere.

Wind changes:—One or two flags, of suitable colour (indetermined). The flags even at a short distance, are objectionable for the proposed aim: with certain directions of wind it is very difficult and in calm weather impossible to make out



what they mean.. I would propose the use of symbols. The diamond  (cone N and cone S joined by the bases) for veering N to S through E: the diavolo  (cones joined by the apex) for backing from S to N through E.

Table B.—Red symbols. It is difficult to distinguish the colours in thick mist or fog, or under certain illumination by the rays of the sun.

If the distance would make the readings of the signals difficult we could have some spare symbols at our disposal, viz.,




 for No. 6  for No. 7  for No. 8

Table C.—It seems to me that all these warnings are provided for by tables A and B. They are comprehensive and have the advantage to be or to become International.

e.g. Local caution: see Table A, No. 1 or B. No. 6

Local Gale: see Table A, Nos. 2, 3, 4, 5.

Distant storms and remarks: There may be uncertainty and multiplication of the codes if other signals may be hung below, or if we are free to act according to local requirements. If the Distant Storm code is adopted all that is required is known.

If not, tables A and B contain all the necessary information.

Table D. I do not think it advisable to extend this code to the Far East. Uniformity would be lost and the codes multiplied.

Our aim is to tell the navigators the same thing with the same method they will find everywhere, without having to change the code every time they change the country.

For distant dangers they will have the Universal (now China-Coast) code.

For local dangers, International Tables A and B are sufficient. For the small sailing boats and the inhabitants of the harbours special signs, known only in the locality may be added without difficulty. For instance, firing a gun, blowing a whistle or lighting red lamps etc.

(Signed) L. FROC, S.J.

APPENDIX 9.

Memorandum on Meteorological Codes by the Superintendent, Malayan Meteorological Service.

The Malayan Meteorological Service fully accepts the principle of the use of uniform codes, units etc., throughout the Far East, and will do whatever may be practicable to give effect to the decisions of the Hong Kong Conference of May 1930. The Malayan Meteorological Service, however, is probably in a different position from that of any other service represented at the Conference not only from considerations of the actual data which it wishes to receive, but also on account of the comparative inexperience of the observing and computing staff. Some of the modifications in codes, as adopted by the Copenhagen Conference of 1929, for example, could not, in my opinion, be used by the Malayan staff without serious risk of confusion.

2. The Malayan Service is of comparatively recent growth. Development has been very rapid and the Malayan Peninsula has now a network of 17 fully equipped stations which cover the needs of the whole country. This rapid development has necessitated a correspondingly abbreviated training period of most of the observing staff. As observers they are competent but not to the extent demanded by the Copenhagen Code. They have been trained to make all the observations necessary and practicable for use with the present International Code and to put their observations into the code. Even in this case I have had to simplify the "present weather" code to some extent, using a much shorter table than the conventional one. The numbers actually in use, however, have in every instance the interpretation given by the old International Code.

3. It will be readily understood that I am not anxious to introduce change at the present time. We are only now getting uniformly reliable messages after a great deal of trouble and I would suggest first, that consideration be given to the possibility of adopting for general use the International Code as it now stands, at any rate until the end of 1930.

4. The code to which I refer is as follows:—11 BBBDD FwwTT cbWVH ALaNh RRRtt, the letters having the usual significance, except that in the fifth group we include only rainfall and the time, to the nearest hour, at which rain commenced (tt).

5. Of these quantities cb is replaced in our messages by the formal figures 99 as barometric tendency is not given. Continuous records of pressure have not been kept in this country and the necessary correction for diurnal variation cannot be made, it will be some considerable time before this can be done.

6. The quantity h (height of lowest cloud) is also replaced by a formal 9, as no data exists regarding cloud heights.

7. This code seems to meet all our needs and the new codes accepted at Copenhagen seem to me to demand too much of observers such as we are compelled to employ, at all events until their experience is very much extended. The cloud codes, for instance, are very complicated and, in my opinion, quite impossible for serious use here.

8. I am not at all anxious to depart from international practice, but the latest revision of the codes seems to have been made with the needs of temperate zone services mainly in view, and I cannot see any necessity for such elaboration as is contemplated, certainly not at the expense of uncertainty in the data which we receive.

9. There was nothing in the Convenor's letter of invitation to indicate the extent of the messages which it was proposed to exchange, or whether the full station observations as quoted in 4, above were to be sent or an abbreviated message. If the latter is intended I would merely suggest that normal international code numbers should be utilised and that the Conference should consider the possibility of including in such messages the barometer reading, wind direction and force, rainfall and approximate time of commencement of rain, the last named being of particular value to Malaya. Whatever observations may be required I will do my best to supply, but these are practically limited to what is given in the model code of para. 4.

10. With regard to units, I am doubtful whether we are yet at the stage in the Far East at which common agreement can be reached. The units here are :—

Barometer	.....millibars
Temperature	.....degree Fahrenheit
Visibility	.....International Code
Rainfall	.....inches.

I am not averse to converting, before coding, into other units but the common units adopted should, I suggest, be so chosen as to give not more than one conversion to each service.

11. In conclusion, I would express my regret that it is not possible for me to attend the Conference, and my confidence that the work of the Conference will eventually be of the greatest value to all our services.

(Signed) S. D. STEWART.

Kuala Lumpur
F.M.S.
10th March, 1930.

APPENDIX 10.

*Note by the Rev. Father Froc, S.J. Zi-ka-wei Observatory, Shanghai,
on the Non-Local Storm Signal Code in use along the China Coast.*

Mr. T. F. Claxton, Director of the Royal Observatory and President of the Meteorological Conference, at Hong Kong, having put forward the idea that the Code now in use along the coasts of China and Indo-China could, without any change, become universal, and consequently be recommended for adoption to all Maritime Services of the world, I have deemed it useful and even necessary to give certain details on its progressive development up to the present state.

The note is not needed by members of the Conference, to each of whom it is familiar, but outside of the Far East the proposed method is unknown, and might appear complicated at first sight. Thus I think it necessary to dwell on two of its characteristics: its consecration by a long experience, since it has been at work in its essential features, in fact in its actual form, since 1883, and its extreme simplicity, each commanding officer being able at first sight to make out what it means, without referring to a table or a book for the numerous (40 perhaps) different systems of each country in the world.

Mr. Claxton's proposal that the China Seas Code should be adopted in the Far East is fully supported by the Chinese Customs and Zi-ka-wei Observatory which I represent. This code has been used by them since 1st February 1918, with many favourable reports on it from all types of vessels.

I consider that this code should be recommended by the Conference for International use.

The essential part of this code was first used at Shanghai in 1884 by R. P. Dechevrens, whose assistant I was at that time. Up till then we had only warned vessels of danger without giving the reason or cause, we henceforward considered it preferable to signal the cause. Both ships and storms being moving objects, the captain of a ship being best situated to know if he was running into danger.

The China Seas were divided into numbered areas, the position of the storm being given by a number representing an area and the direction of motion, by a second number. These numbers were signalled by the Marryat Code. It would have been possible to signal latitude and longitude, but information was too scanty to place the storm so exactly.

At first signals were only hoisted in Shanghai. Then Chinese Customs built coastal semaphores and the Cable Companies offered free service, and in time the Marryat Code was replaced by the International Code of Signals.

As soon as the system of semaphore stations spread, the difficulty of reading flags, during calms and from the direction of the wind became apparent.

In 1909 therefore, it was decided to adopt symbols representing numbers, but only six were devised viz:—the sphere, the cylinder, the cone, point up or down and two cones point to point or base to base.

Due to the increasing number of stations, the area giving the position of the storm was able to be reduced i.e. the number of areas was increased. But the limited number of symbols did not permit us to attain an end which henceforward we had in view.

At the Tokio Congress in 1913, uniform signals were decided upon, but the system of division into areas was retained. The main disadvantage of this was that the position of the storm had to be looked up in a code, and that each country had to have a different code so as to represent their particular areas.

Ever since the beginning of the Tokio Congress I had in mind that 10 symbols would permit the use of latitude and longitude, which would be applicable to all countries.

I consulted Capt. W. F. Tyler, Coast Inspector, on the subject but it was not until 1914 that R. P. Gauthier solved the problem by finding two new symbols, viz:—the "stick" (a long thin cylinder) and the "cheese" (a short wide cylinder). These symbols separately and in combination gave five more numbers.

The Coastal Customs carried out practical experiments for two years to decide on the best size of each symbol. Captain Tyler found dimensions which made each symbol plainly visible at the same distance. The present system was thus reached and the code was brought into force from 1st February 1918. A second edition was published in 1920 giving night signals which, as far as I know, were only used at Shanghai.

This code has been adopted by Indo-China, Hong Kong and Tsingtao, and in an earlier form was used by Vladivostock. So practically the whole Eastern Asiatic Coast, except Korea is in uniformity.

I should like to add, for the benefit of countries where this system is unknown, that its great advantage is that it is not necessary to refer to a code. Having learnt the meaning of the symbols, latitude and longitude and direction of motion can be read from the semaphore without recourse to a book. This is greatly appreciated by captains of ships.

Finally, as Mr. Claxton remarks, the same system is suitable for all countries, the difficulty of using different codes for each country is obviated and the chance of error minimised.

If this Non-Local Code were adopted by the whole world, it would be of immense service to seamen, while it would always permit special signals suitable for particular localities (*e.g.* coloured signals or sound signals) to be used locally when necessary.

(Signed) L. FROC, S.J.

RESOLUTIONS ADOPTED AT THE HONG KONG METEOROLOGICAL
CONFERENCE, 1930.

1. That the Japanese Government be asked to give 6 a.m. observations, 120th meridian time, in their daily weather messages by cable, and to arrange for observations to be made also at 2 p.m. (page 15).

2. The Conference, having adopted 6 a.m. and 2 p.m. of the 120th meridian as the most suitable hours of observation for the Far East, emphasises the necessity of all stations falling into line with this decision, to enable observatories in the Far East to make truly synchronous weather maps. (page 15).

3. That the 1929 International Code for land stations be used for broadcasting synoptic messages—first four groups obligatory and remainder optional—with a note to the effect that 'x' means no observation. (page 15).

4. The Conference recognises the great importance to the Meteorology of the China Seas of the Meteorological Station established at Pratas by the Government of China. It expresses the hope and voices the desire that similar stations be established in zones not yet represented, especially on the Macclesfield Bank and the Paracels. (page 20).

5. The Conference recommends that the Six-Letter Code for the transmission of weather telegrams by cable, proposed by the Director of the Royal Observatory, Hong Kong, as amended at the Conference, should be adopted throughout the Far East. (page 22).

6. The Conference recommends that the Hong Kong Code as amended at the Conference, be adopted by Weather Services in the Far East which use a Local Storm Signal Code. Each Service to print its own description of the Code, with local particulars. (page 27).

7. The Conference expresses the hope that masters of ships wishing to draw a weather map, may be allowed to apply to the Pratas Meteorological Station for observations from land stations, received daily from the various Weather Services in the Far East. (page 28).

8. That the International Meteorological Committee be asked to assign index numbers to Meteorological Stations in the Far East. (page 29).

9. The Conference recommends that the following information be asked for from ships operating in the Far East.

- (a) Latitude (four figures)
Longitude (five figures)
Date.
G.M.T. of observation (four figures)
- (b) Barometer reading (any unit) corrected for index error and reduced to 32 F., sea-level and standard gravity; adding "steady", "rising" or "falling", when possible. If sent without correction the reading to be followed by the word "uncorrected".
- (c) Air temperature (two figures of any scale)
- (d) Temperature of sea surface (two figures of any scale)
- (e) Wind direction and force (Beaufort) adding "steady", "veering" or "backing", when possible.
- (f) State of sea (0-9)
- (g) Direction of swell. N, N.N.E. etc. or confused, and height of swell (None, low, moderate or heavy).
- (h) Visibility (0-9) (Figures of Table VI (b) International Code, 1929. Fog to be reported under "weather".)
- (i) Weather (in plain language) "fine" meaning sky cloudless or less than $\frac{1}{4}$ clouded; "fair" $\frac{1}{4}$ to $\frac{3}{4}$ clouded; "cloudy" more than $\frac{3}{4}$ clouded; "overcast" sky covered with one impervious cloud. (These four conditions can be represented by symbols on the weather maps).

The joint "Notice to Mariners" to contain barometer reduction tables, with an example in British and Metric units. Also a copy of Code VI(b) of the International Code, 1929. The words "shipping companies" to be added to the word "shipmasters" in paragraph 1 of the Hong Kong Notice, and that ships be requested to send observations to the various observatories via the nearest wireless station. (page 31).

10. The Conference considers that it is undesirable for private stations to issue weather forecasts without a complete signature. (page 32).

11. The Conference emphasises the desirability of using short wave for the transmission of Weather messages between observatories, in order to minimise interference by atmospherics. (page 33).

12. That the Japanese Government be asked to broadcast 2 p.m. observations from Palau daily, at some convenient time (on short wave, if possible) (page 33).

13. The Conference recommends that the China Seas Storm Signal Code, as revised by the Director of the Royal Observatory, Hong Kong, and amended at the Conference, be adopted by Weather Services in the Far East which use a Non-Local Storm Signal Code. (page 38).

14. The Conference emphasises the extreme utility of the China Seas Non-Local Storm Signal Code, as shown by the experience of the past twelve years, and would ask Maritime Weather Bureaus to give this Code due consideration before adopting any form of Non-Local Storm Signal Code. (page 38).

15. The Conference recommends that Far Eastern Weather Services should publish, according to a uniform plan, the observations received from ships by wire-

less telegraphy. One year's observations to be published by each observatory in rotation. It is desirable that :

- (a) No observations should be published from ships in the vicinity of a land station.
- (b) Except during the typhoon season, only those observations should be published which emanate from areas the meteorology of which is very little known.
- (c) Observations made by ships in typhoon weather should be printed in greater detail than at present and due recognition given to observers. (pages 39 and 40).

16. The Conference agreed, in principle, to a proposal by Lieut.-Comdr. Dodington that observatories in the Far East should include in their synoptic messages any observations they receive from ships: the question of code and other details to be settled by correspondence. (page 40).

LOCAL STORM SIGNAL CODE.

Recommended for use in the Far East at a Conference of Directors of Far Eastern Weather Services, held at Hong Kong, in the year 1930.

DAY SIGNALS.

SIGNAL.	SYMBOL.	MEANING.
1	Black T.	A depression or typhoon exists which may possibly affect the locality.
2	Black horizontal bar (actually a flat cylinder).	Strong wind with squalls may possibly occur from the S.W.
3	Black inverted T.	Strong wind with squalls may possibly occur from the S.E.
4	Black diamond	Typhoon dangerous but danger to locality not imminent.
5	Black cone point upward	Gale expected from the N.W. (W.-N.)
6	Black cone point downward	Gale expected from the S.W. (S.-W.)
7	Black drum	Gale expected from the N.E. (N.-E.)
8	Black sphere	Gale expected from the S.E. (E.-S.)
9	Black hour glass	Gale expected to increase.
10	Black cross	Wind of typhoon force expected (any direction).

NIGHT SIGNALS.

1	2	3	4	5	6	7	8	9	10
White	White	Green	White	White	Green	Green	White	Green	Red
White	Green	White	White	Green	White	Green	White	Green	Green
White	White	Green	Red	Green	White	White	Green	Green	Red

NON-LOCAL STORM SIGNAL CODE, SUITABLE UNIVERSALLY FOR VISUAL AND TELEGRAPHIC STORM WARNINGS, ALSO FOR THE "GENERAL INFERENCE" FOLLOWING SYNOPTIC WEATHER MESSAGES.

The Code is an adaptation of the China Seas Storm Signal Code which has been in use in China since 1918.

The following ten symbols are used:—



indicating the figures

1 2 3 4 5 6 7 8 9 0

(2) The signals are hoisted at the yard-arms and at the mast head of a Storm Signal Mast and have the following significance:—

Typhoon and depression Signals:—

- (a) 4 symbols at one yard-arm showing the position of the centre.
- (b) 3 symbols at the other yard-arm, showing the direction of motion or, alternatively, certain conditions; also the accuracy with which the centre has been located, and the intensity. (Tables 1, 2 and 3).
- (c) 1 symbol at the mast head showing the time at which the centre was in the position indicated (Table 4).

Gale Signals:—

- (d) 1 symbol at one yard-arm showing the region threatened (Table 5).
- (e) 2 symbols at the other yard-arm showing the general direction from which the gale is blowing, in points: 08=East, 16=South, 24=West, 32=North.
- (f) 1 symbol at the mast head showing the time at which the gale was as stated.

(3) The two upper symbols of group (a) indicate by their corresponding numbers the latitude, and the two lower symbols the longitude, of the centre of a circle (of a radius specified by the lowest symbol of group (b)) within which the centre of the typhoon or depression lies. The symbols for longitude give the tens and units only; thus 32 indicates longitude 132°.

(4) The two upper symbols of group (b) indicate the direction in which the typhoon etc., is travelling (Table No. 1) or alternatively, certain conditions (Table 2).

(5) The third and lowest symbol of the group (b) indicates the radius of the circle whose centre is shown by the latitude and longitude, together with the degree of intensity or, alternatively, one of four conditions which can sometimes be given in addition to the direction of motion (Table 1) and in preference to the radius and intensity signal.

(6) The only velocity signals given are "stationary or very slow", which is an alternative to the direction of motion, and "exceptionally high rate of travel" which may be given in addition to direction of motion.

In this connection the following table, extracted from the China Seas Storm Signal Code will be useful:—

Latitude (North).	Rate of travel of typhoons in the Far East (Knots).							
	Before recurving.				After recurving.			
	Ordinary limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.	Ordinary limits.	Mean.	Exceptional Velocity as signalled.	Maximum recorded.
5 to 15	5 to 12	9	11 or above	22	—	—	—	—
15 „ 20	5 „ 14	10	12½ „	24	5 to 17	10	13 or above	22
20 „ 25	7 „ 16	11	13 „	19	14 „ 23	17	21 „	30
25 „ 30	7 „ 13	11	13 „	15	11 „ 23	18	23 „	47
30 „ 35	—	—	—	10	11 „ 36	20	25 „	42
35 „ 40	—	—	—	16	12 „ 36	21	26 „	50
40 „ 45	—	—	—	—	17 „ 36	21	26 „	48
45 „ 50	—	—	—	—	12 „ 36	21	26 „	52
50 „ 55	—	—	—	—	12 „ 37	21	26 „	49

(7) *Caution.*—The position indicated by the latitude and longitude signals does not purport to be the position of the centre of the typhoon, but merely the centre of a circle of specified radius within which the centre of the typhoon is believed to lie.

(8) In the China Seas Code the Time Signal (Table 4) indicates the time at which the warning was issued. In the present code it shows the time at which the typhoon or depression was in the position indicated. The table has been expanded as observations are now available from certain stations at 11h and 17h. Symbol No. 9 provides for occasions when the centre has been located from observations at other than routine hours.

(9) The code can also be used for the “general inference” following a synoptic message.

Thus:—An anticyclone, central in latitude 36° N. and longitude 110° E. is strengthening and moving eastward, and the depression appears to be stationary in latitude 22° N. and longitude 104° E., but the position is only approximate,

would be:—

3610367

2204790.

The “general inference” may, if necessary, be followed by a few words *en clair*.

(10) The code is suitable for international use. The origin of the message will indicate whether the latitude (and longitude) is positive or negative. In a message from, say, Tokio, the latitude would be North and the longitude East. From, say, Rio de Janeiro, the latitude would be South and the longitude West.

The condition signals of Table 2 may be extended by international agreement.

If necessary each Weather Bureau can have its own Table 4 printed under Table 4 of this code. Similarly with Table 5.

TABLE 1 :—DIRECTION SIGNALS.

Two upper symbols of hoist.

Direction of motion.	Code Figures.			
	Typhoon.	(a) Typhoon or Depression.	Depression.	Anticyclone.
NNE	0 2	6 2	0 0	3 3
NE	0 4	6 4	0 1	3 4
ENE	0 6	6 6	0 3	3 5
E	0 8	6 8	0 5	3 6
ESE	1 0	7 0	0 7	3 7
SE	1 2	7 2	0 9	3 8
SSE	1 4	7 4	1 1	3 9
S	1 6	7 6	1 3	4 0
SSW	1 8	7 8	1 5	4 1
SW	2 0	8 0	1 7	4 2
WSW	2 2	8 2	1 9	4 3
W	2 4	8 4	2 1	4 4
WNW	2 6	8 6	2 3	4 5
NW	2 8	8 8	2 5	4 6
NNW	3 0	9 0	2 7	4 7
N	3 2	9 2	2 9	4 8
Unknown	5 3	9 3	3 1	4 9
Column	2	3	4	5

The table serves for typhoons, depressions and anticyclones: also for the doubtful case: typhoon or depression.

The figures in the last two columns will not be displayed on the storm signal masts. They are for the "general inference" following a synoptic message. The display of the figures in column 3 is optional.

(a) The word "typhoon" has been retained as it is in general use throughout the Far East. The word "cyclone" is in this case preferable.

TABLE 2 :—CONDITION SIGNALS.

(Alternative to Table 1).

Two upper symbols of hoist.

Typhoon.		Depression.		Anticyclone.	
Code figures.	Condition.	Code figures.	Condition.	Code figures.	Condition.
5 1	Forming.	7 3	Forming.	8 7	Forming.
5 2	Two centres.	7 5	Filling up.	8 9	Dissipating.
5 4	Stationary or very slow.	7 7	Filled up.	9 1	Dissipated.
5 5	Curving N	7 9	Stationary or very slow.	9 4	Spreading N
5 6	„ NE	8 1	—	9 5	„ E
5 7	„ E	8 3	V-shaped depression.	9 6	„ S
5 9	„ SE	8 5	No remarks.	9 7	Northern portion has moved eastward, leaving a separate anticyclone over China.
6 1	„ S				
6 3	„ SW			9 8	Stationary or very slow.
6 5	„ W			9 9	No remarks.
6 7	„ NW				
6 9	Filling up or curving. N				
7 1	„ NE				
5 8	Filling up.				
6 0	Filled up.				
Column ..	2	3	4	5	6

The figures in columns 3 and 5 will not be displayed on the storm signal masts. They are for the “general inference” following a synoptic message.

TABLE 3 :—RADIUS AND INTENSITY SIGNALS.

The lowest of three Symbols.

(a) Code figures.	A typhoon or a depression.		Anticyclone.	
	Radius of position circle.	Intensity etc.	Radius of position circle.	Condition.
1	120'	Unknown.	150'	Feeble.
2	120'	Severe.	150'	Moderate.
3	60'	Unknown.	150'	Strong.
4	60'	Severe.	120'	Feeble.
5	—	Deepened.	120'	Moderate.
6	30'	Unknown.	120'	Strong.
7	30'	Severe.	—	Strengthening.
8	—	Exceptionally high rate of travel.	—	A vague area of high pressure.
9	—	Continental depres- sion (b).	—	—
0	—	Position of centre uncertain.	—	Position of centre uncertain.

The word "typhoon" has been retained as it is in general use throughout the Far East. Used in conjunction with the "intensity" signal the word "cyclone" would be preferable.

(a) The figures in Table 1 will indicate whether the figures in this column refer to a typhoon, a depression, an anticyclone or the doubtful case of "typhoon or depression".

(b) As there is no column for "continental depression" in Table 1, when this signal is sent the direction of motion will be given by means of the figures in column 2 of Table 1, so as to maintain the practice of former years.

TABLE 4:—TIME SIGNALS

Single Symbol at Masthead.

Day.	Today.				Yesterday.				
Code figures.	1	2	3	4	5	6	7	8	9
Time of 120th meridian, E.	6 a.m.	11 a.m.	2 p.m.	5 p.m.	6 a.m.	11 a.m.	2 p.m.	5 p.m.	Position deduced from supplementary information received since last warning.

TABLE 5:—GALE SIGNALS.

One Symbol at yard-arm showing the locality of the gale.

Code figures.	District.
1	Annam Coast.
2	Gulf of Tonkin.
3	Formosa Channel.
3	Formosa to Yangtze.
5	Yangtze to Shangtung Promontory.
6	Gulf of Pechili and Yalu Gulf.
7	Sea of Japan.
8	North of Hokkaido.
9	East Coast of Japan.
0	South of Kiushiu.

SIX-LETTER CODE FOR THE TRANSMISSION OF WEATHER TELEGRAMS BY CABLE

Recommended for use in the Far East at a Conference of Directors of Far Eastern Weather Services, held at Hong Kong in the year 1930.

CODE LETTER	FIRST LETTER	SECOND LETTER	FIRST LETTER	SECOND LETTER	FIRST LETTER	SECOND LETTER	THIRD LETTER	FOURTH LETTER		FIFTH LETTER	SIXTH LETTER.	Code letter	Code Time (e)
	BAROMETER						WIND DIRECTION	WIND FORCE (Beaufort)	VISIBILITY (d)	TEMPERATURE (Centigrade)	WEATHER.		
	MILLIMETRES		INCHES		MILLIBARS								
A	714(a)	0.0	28.11(a)	.00	952 (a)	0.0	N	(c) 0-2		-24° or 25° or +12°	Cloudless or sky less than ¼ clouded.	○	1 a.m.
B	717	0.1	23	.01	956	0.1 or 0.2	NNE	3-4		-22 " 23 " +13	Sky ¼ to ¾ clouded.	⊙	2
C	720	0.2 or 0.3	35	.02	960	0.3	NE	5-6	0-2	-20 " 21 " +14	Sky more than ¾ clouded.	⊕	3
D	723	0.4	46	.03	964	0.4 or 0.5	ENE	7-8		-18 " 19 " +15	Sky overcast.	⊗	4
E	726	0.5	58	.04	968	0.6 or 0.7	E	9-10		-16 " 17 " +16	Rain.	●	5
F	729	0.6	70	.05	972	0.8	ESE	11-12		-14 " 15 " +17	Snow.	*	6
G	732	0.7	82	.06	976	0.9 or 1.0	SE	(c) 0-2		-12 " 13 " +18	Hail.	▲	7
H	735	0.8	94	.07	980	1.1	SSE	3-4		-10 " 11 " +19	Thunder.	⬆	8
I	738	0.9 or 1.0	29.06	.08	984	1.2 or 1.3	S	5-6	3-4	-8 " 9 " +20	Thunderstorm.	⬇	9
J	741	1.1	17	.09	988	1.4 or 1.5	SSW	7-8		-6 " 7 " +21	Haze.	8	...
K	744	1.2	29	.10	992	1.6	SW	9-10		-4 " 5 " +22			10
L	747	1.3	41	.11	996	1.7 or 1.8	WSW	11-12		-2 " 3 " +23			11
M	750	1.4	53	...	1000	1.9	W	(c) 0-2		0 " " +24			noon
N	753	1.5 or 1.6	65	...	1004	2.0 or 2.1	WNW	3-4		0 " " +25	(15 vacancies to be filled by agreement).		1 p.m.
O	756	1.7	76	...	1008	2.2 or 2.3	NW	5-6	5-6	+1 " " +26			2
P	759	1.8	88	...	1012	2.4	NNW	7-8		+2 " " +27			3
Q	762	1.9	30.00	...	1016	2.5 or 2.6	Calm	9-10		+3 " " +28			4
R	765	2.0	12	...	1020	2.7 or 2.8	...	11-12		+4 " " +29			5
S	768	2.1 or 2.2	24	...	1024	2.9	...	(c) 0-2		+5 " " +30			6
T	771	2.3	36	...	1028	3.0 or 3.1	...	3-4		+6 " " +31			7
U	774	2.4	47	...	1032	3.2	...	5-6	7-9	+7 " " +32			8
V	777	2.5	59	...	1036	3.3 or 3.4	...	7-8		+8 " " +34			9
W	780	2.6	71	...	1040	3.5	...	9-10		+9 " " +36			10
Y	783	2.7 or 2.8	83	...	1044	3.6 or 3.7	...	11-12		+10 " " +38			midn.
Z	786(b)	2.9	94(b)	...	1048(b)	3.8 or 3.9	...	...		+11 " " +40			10

X : no instrumental reading
 (a) : or below
 (b) : or above

(c) If a wind direction is given the force will be 2. Force 0-1 is indicated by the word "calm" in the previous column.

(d) Code VI of the International Code, 1929.
 (e) As used by the Cable Companies.