19. COMMISSION DE LA VARIATION DES LATITUDES

PRÉSIDENT: M. H. KIMURA, *Director of the International Latitude Observatory, Mizusawa, Japan.*

MEMBRES: MM. Bemporad, Beneš, Carnera, Dawson, Dodwell, Esclangon, Hashimoto, Jackson, Jones, W. D. Lambert, Littell, Muller, Nijland, Peisino, Schlesinger, Stetson, Voûte.

A. PROVISIONAL RESULTS OF THE OBSERVATIONS OF THE LATITUDE VARIATION DURING THE PAST FOUR YEARS

1. *International Latitude Service*

The values given below are those published in every annual report of the international latitude work. Those for the first three years were calculated from the observed results in three stations, namely, Mizusawa, Carloforte and Ukiah, while that for the last year was from the results of four stations with one additional station, Kitab.

				Year				
Frac-tion	1928		1929		1930		1931	
of year	X	Y	X	Y	X	Y	X	Y
	$''$	$''$	$''$	$''$	$''$	$''$	$''$	$''$
·0	−·06	−·05	−·10	+·03	−·14	−·04	−·13	−·04
·1	−·09	−·02	−·09	+·05	−·15	+·04	−·16	+·03
·2	−·09	·00	−·06	+·07	−·12	+·13	−·16	+·09
·3	−·06	+·02	·00	+·11	−·07	+·16	−·10	+·15
·4	−·03	+·03	+·05	+·13	·00	+·16	−·01	+·19
·5	−·01	+·03	+·09	+·06	+·09	+·12	+·10	+·18
·6	+·01	+·02	+·11	−·02	+·17	+·06	+·18	+·12
·7	−·02	+·01	+·07	−·08	+·14	−·03	+·18	+·02
·8	−·06	·00	−·02	−·10	+·06	−·08	+·09	−·07
·9	−·09	+·01	−·09	−·10	−·03	−·09	−·01	−·12

2. *Royal Observatory, Greenwich*

The following values were taken directly from *M.N.* No. 5, March of each year.

		Year		
Fraction of year	1927	1928	1929	1930
	$''$	$''$	$''$	$''$
·0	+·07	−·04	−·02	−·20
·1	+·06	−·06	−·03	−·20
·2	+·04	−·06	+·02	−·17
·3	+·02	−·05	+·03	−·10
·4	+·01	−·03	+·03	−·02
·5	+·03	+·04	+·09	+·07
·6	+·06	+·09	+·10	+·16
·7	+·07	+·03	+·04	+·14
·8	+·04	·00	−·05	+·06
·9	·00	−·03	−·16	−·06

3. *Naval Observatory, Washington*

The following values were taken directly from *A.J.* Nos. 914, 935, 947, 961.

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|	Year			
Fraction of year	1927	1928	1929	1930
	"	"	"	"
·0	·00	−·04	+·02	−·09
·1	−·03	−·05	+·01	−·05
·2	−·02	−·06	·00	+·01
·3	+·02	−·05	+·04	+·03
·4	·00	−·05	+·03	+·01
·5	−·07	−·03	+·01	−·02
·6	−·09	−·03	−·01	−·08
·7	−·07	−·02	−·04	−·11
·8	−·07	−·02	−·11	−·13
·9	−·06	−·01	−·11	−·14

4. *New values of* X *and* Y *for the Period* 1927.0–1930.9 *deduced by combining the results of Greenwich and Washington with those of the International Service*

This is the continuation of the values given in the preceding Transactions (vol. III) of the I.A.U. The data used are those in the above tables, but with corrections of the respective Z given below for Greenwich and Washington, and that of the international results for the year 1927 was taken from the values given in the above transaction. The following Z for each observatory is obtained by taking the simple means of residuals in the sense Greenwich or Washington minus International for each tenth of the year; the period covered is just 8 years, 1923–30.

	1923–30	
Fraction of year	Z_g	Z_w
	"	"
·0	−·004	−·016
·1	+·008	−·025
·2	+·012	−·029
·3	−·006	−·035
·4	−·026	−·069
·5	−·014	−·093
·6	·000	−·086
·7	−·001	−·045
·8	−·006	−·031
·9	−·015	−·028

The following new values of the polar motion were calculated by the method of least squares, with the weights 1·84 and 1·11 for the international values of X and Y respectively and 1 for the values of the two observatories.

	Year							
	1927		1928		1929		1930	
Fraction of year	X	Y	X	Y	X	Y	X	Y
	"	"	"	"	"	"	"	"
·0	+·02	+·01	−·05	−·03	−·07	+·04	−·16	−·04
·1	+·01	−·01	−·08	−·01	−·07	+·05	−·17	+·03
·2	·00	−·01	−·08	−·01	−·04	+·06	−·14	+·11
·3	·00	+·02	−·05	+·01	+·01	+·10	−·08	+·13
·4	+·02	+·05	−·02	+·03	+·05	+·11	·00	+·13
·5	+·03	+·02	+·01	+·04	+·10	+·07	+·08	+·09
·6	+·05	+·01	+·04	+·04	+·11	+·02	+·16	+·02
·7	+·05	−·03	·00	+·02	+·06	−·04	+·14	−·06
·8	+·02	−·04	−·04	+·01	−·03	−·09	+·06	−·10
·9	−·01	−·04	−·06	+·02	−·11	−·08	−·03	−·10

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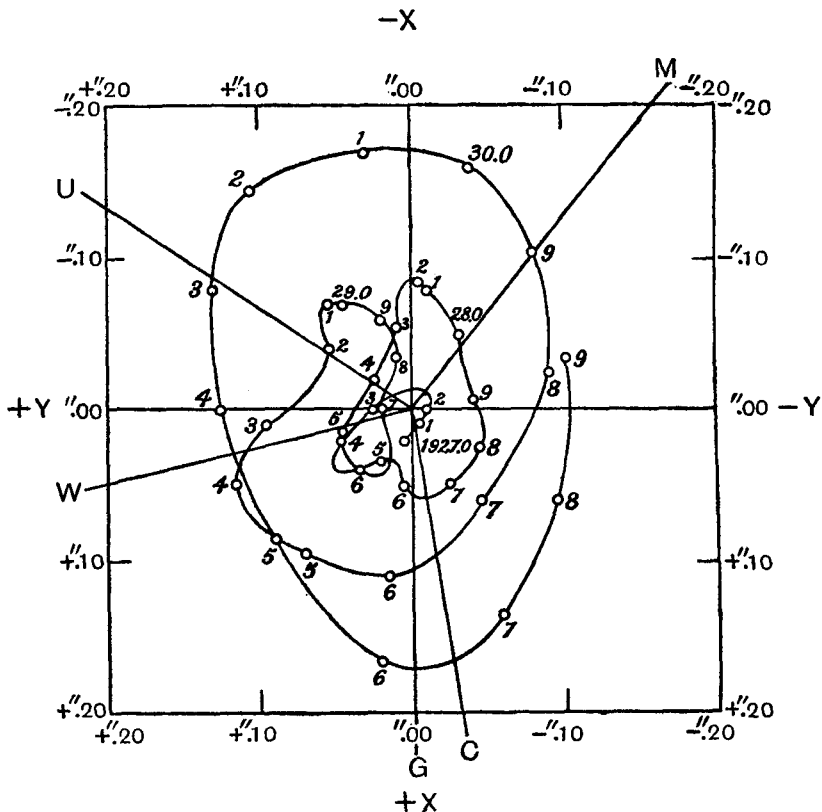
Path of the Polar Motion, 1927.0–30.9.

B. New International Latitude Station at Kitab

The instrument used is a large zenith-telescope newly constructed for the purpose at Bambergwerk; its aperture is 110 mm. and its focal length 1289 mm. According to the kind report from Mr Stoiloff, the director, the instrument had once a side-flexure of as considerable an amount as 8ˢ, but on retightening the telescope with the horizontal axis in the workshop at Taschkent Observatory, it was reduced to the ordinary value. After careful setting of the instrument, the regular observations of latitude began on November 9, 1930. Before this epoch, fairly long and numerous observations, though discontinuous, were made, but the director himself did not hope to combine them with those of the other international stations, by reason of the incompleteness of the instrument quoted above and of many other circumstances. Thus I have agreed to his opinion in giving up the observations before the date announced.

The number of observers in this station is generally single.

C. Reopening of the International Latitude Station at Gaithersburg

Following is the abstract of the report from Mr W. D. Lambert of the U.S. Coast and Geodetic Survey.

The reopening of the Gaithersburg Latitude Observatory is fully reported by

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Mr Swick, who has been in charge of it, in a paper entitled "Plans for reopening Gaithersburg Latitude Observatory," presented on December 28, 1931, at a meeting of the American Astronomical Society held in Washington.

The paper states that as soon as Ukiah came under the control of the U.S. Coast and Geodetic Survey, the question of reopening the Gaithersburg Observatory came up for consideration. Many astronomers, not only in America but also abroad, were much concerned to have as short a break as possible in the Gaithersburg observations. After much hard work by the various astronomers interested in the work, a bill was finally passed by Congress in 1930 appropriating $2500 to the Coast and Geodetic Survey for the annual cost of operating the station. This appropriation became available on July 1, 1930.

The observatory building, the dwelling-house and the office were thoroughly repaired and modernized and made ready for the installation of the instrument and the employment of an observer. The cost of the work has amounted to $4000. There remains about $1000 of this year's appropriation and an experienced observer will be in position and should start observing about the middle of February 1932.

The instrument to be used at Gaithersburg is the same one formerly used there, and it is one of four large zenith-telescopes made by Wanschaff in Berlin, specially constructed for the purpose just before the north international service was begun. As the whole instrument in its case had been put down for many years in the basement store-room at the old building of the Coast and Geodetic Survey, every steel screw was rusted and almost every inch of surface on the whole instrument deteriorated; even the objective was slightly stained. These parts have, however, just been completely overhauled by the Instrument Division of the Coast and Geodetic Survey.

[Observations at Gaithersburg were recommenced on April 14, 1932. The observer at the station is Mr Earl L. Williams.]

D. International Station in the Southern Hemisphere in the South Parallel — 34° 50'

The star-programme for the southern hemisphere, like that of the northern one, consists of 12 groups, but the number of pairs contained in each group is reduced to 6 against 8, and to make up the deficiency of the number of pairs the lowest brightness has been restricted to 7·0 magnitude. Why such modifications were made is for the following reasons:

(1) The comparison between two results of latitude variations for two periods 1900–5 and 1906–11 showed that no difference in their accuracies could be found, in spite of the number of pairs being different, 6 and 8 for the first and second epochs respectively.

(2) The present programme for the north international parallel contains too faint stars in going down to 7·5 magnitude, as some observers complained of this. And in fact the total sum of the observed pairs of faint stars seems to be nearly equal to that of the brighter pairs though a little less in their number, because usually bright stars may be observable even in the nights when the sky is covered with thin clouds.

The observing programme is just the same as that for the north international parallel.

The apparent declinations of all star-pairs have been calculated in the Central Bureau, and those for the years 1931 and 1932 have been completed and already sent to both observatories.

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The following are the reports from the directors of the two observatories, namely, Prof. Hartmann in La Plata and Mr Dodwell in Adelaide.

La Plata

The latitude observer, Señor Virginio Manganiello, began the observations with the Wanschaff zenith-telescope in August 1929; from January 1932 he will be replaced by another observer.

List of observations

	Groups	Nights	Observed pairs	Connections of the groups by pairs
1929	X–XI	4	26	4
	XI–XII	6	39	13
	XII–I	5	39	13
	I–II	5	38	12
	II–III	4	23	1
1930	III–IV	5	38	14
	IV–V	5	36	5
	V–VI	3	22	1
	VI–VII	7	64	24
	VII–VIII	5	32	9
	VIII–IX	8	46	13
	IX–X	7	73	31
	X–XI	2	16	4
	XI–XII	7	39	9
	XII–I	4	22	7
	I–II	1	6	0
	II–III	7	54	16
1931	III–IV	5	36	11
	IV–V	7	62	23
	V–VI	8	74	26
	VI–VII	6	57	23
	VII–VIII	6	44	13
	VIII–IX	2	17	5
	IX–X	1	2	0
	X–XI	4	24	6
	XI–XII	2	21	9
	XII–I	6	33	6

A very useful contribution to the southern latitude service is the new determination of exact meridian positions of the 144 latitude stars, which our astronomer, Señor Hugo A. Martinez, has recently obtained. There are some stars with remarkable proper motion among them. Now Mr Martinez is collecting all the former observations of these stars to determine the best values of p.m.

Adelaide

$\phi = 35° 54' 38'' S. \quad \lambda = 9^h 14^m 19^s.80 E.$

Height above Mean Sea Level 135 feet.

Through the kindness of Dr Kimura, the zenith-telescope formerly used at Mizusawa was made available for the International Latitude Service at Adelaide, and was received at this Observatory in October 1930. An observing house, constructed on a plan similar to that recommended for all the International Latitude Stations, had been erected in the Observatory grounds in readiness for the instrument, and this was set up immediately upon its arrival. The azimuth marks were

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also fixed on a concrete block, 92·3 metres north of the zenith-telescope, and protected by a casing made of galvanized iron.

Cloudy weather delayed the instrumental adjustments, and the first observations were made on November 24–25, 1930. The observers in charge of the work are Messrs A. L. Dawson, B.Sc. and A. E. Markey.

The following is a summary of the observations made up to December 31, 1931.

1930	November	12 pairs on 2 nights		
	December	64	,,	6	,,
1931	January	69	,,	6	,,
	February	70	,,	6	,,
	March	77	,,	8	,,
	April	45	,,	5	,,
	May	19	,,	4	,,
	June	35	,,	4	,,
	July	—		—	
	August	56	,,	5	,,
	September	70	,,	7	,,
	October	71	,,	7	,,
	November	54	,,	6	,,
	December	77	,,	8	,,
	TOTAL	719	,,	74	,,

During the year 1931 the weather at Adelaide was exceptionally cloudy, and the number of rainy days in May was a record for any one month in the whole of the meteorological records. During July the sky was overcast with cloud throughout the month.

The values of the Horrebow Levels were found by using a theodolite as a collimator and also by observations of a measuring stick, as a check, according to the methods indicated by Dr Kimura and described in detail by Professor Wanach in *A.N.* 3628. The results obtained were the same as those found at Mizusawa for this instrument.

Circumpolar stars were taken at greatest elongation to find the value of one revolution of the micrometer screw, as in the following table:

				Elongation	Observations
1931	January	ξ	Octantis	East	1
	March	o	,,	West	1
	May–June	χ	,,	East	3
	June–July	σ	,,	East	4
	June	ξ	,,	West	1
	September–October	z	,,	West	2
	September	o	,,	East	1
	October	26 G.	,,	West	4
	November–December	χ	,,	West	2
	December	σ	,,	West	2
	December	ζ	,,	East	2

The observation-books were sent to Dr Kimura for reduction of the observations at Mizusawa, and for this assistance, and for his kindness in giving detailed advice regarding the method of observation, and smoothing out the various initial difficulties, and forwarding star-lists, etc., our hearty thanks are due.

As seen in the above reports, the La Plata Observatory has shown special kindness in observing the declinations of all latitude stars and also in finding their

proper motions and places. Many thanks are due to the director for this elaborate work.

The observation-book of the La Plata Observatory had not arrived at the Central Bureau at the date of writing, but the director recently wrote that he was sending it to me in due course.

On the other hand, the Bureau is receiving the copies of observation-books from Adelaide, and the reductions of the observations have been carried on there.

E. International Latitude Station at Batavia, Java

The detailed report was published in *Het internationale Breedtestation, Batavia, door K. Gsölipointner*; a reprint was kindly sent to me by Prof. Schepers, the Chief of the Triangulation Brigade, under whose superintendence the latitude work is being carried on.

The following is an abstract of the report above cited.

The choice of the spot where the observing house lies was very carefully made, special attention being paid to the meteorological, seismological and topographical conditions even to the distribution of the plants in its surroundings. It is on the western end of the Tjililitan flying camp which is 15 kilometres distant, south from Batavia, and 19 kilometres from the northern coast of Java. A mountain range lies not very far from it towards the south.

The geographical positions of the centre of the instrument are $\phi = -6° 15' 38''$ and $\lambda = 106° 53'$ east of Greenwich. The pillar for the instrument and the observing house are generally similar to those of the north international stations. A special point of the excellence of the observing house is that it is so arranged that the observations may be made in free air, allowing free mutual passages of air internal and external, the opening of the roof being a little larger than the room itself, and also all windows and doors which are made as wide as possible being left open. This mode of construction for the observing house should be ideal.

The instrument used is the large zenith-telescope newly made in Bambergwerk for the purpose. It was reported from the director that the instrument was constructed unsatisfactorily in some respects: it has large side-flexure of about 5^s; this though constant has not been remedied despite every effort, but in spite of such failure the results of the observations seem to be good.

The choice of star-pairs for this station was made by myself, and the star programme and the observing plan are just the same in their forms and principles. In other words, the whole series consists of 12 groups each of which contains 6 pairs, the lowest brightness being limited to 7·0 magnitude, and the observing plan is just the same as for the north parallel. The mean places for 1930.0 and the proper motions were kindly carried out by Mr C. Sanders of the Leiden Observatory through the kindness of Prof. de Sitter, the director. Hearty thanks are due to the above two gentlemen. Regular observations were begun on September 16, 1930.

F. Report from Prof. Dr J. J. A. Muller on the Results of the International Latitude Service 1912.0–1922.7

The report by letter read:

"Dr H. Kimura

My dear Colleague,

I think that it will be interesting for you to hear that the results of the International Latitude Service 1912.0/1922.7, elaborated by Prof. Mahnkopf of the

Geodetic Institute at Potsdam, are now in the press. They will appear next April as 'Band VI' of the 'Resultate des Internationalen Breitendienstes' and be distributed among the persons interested in the same manner as the former Parts.

After the death of our much regretted colleague Gautier, Prof. Dr F. Baeschlin at Zollikon (Switzerland) has taken his place as a liquidator of the Restricted Geodetic Association, which was dissolved in 1923. This work of both of us will thus come to an end before long.

I remain, dear Colleague,

Very truly yours

J. J. A. MULLER."

Since the receipt of this letter the reductions by Prof. Mahnkopf have been published: they have not appeared as Band VI as suggested above but as an independent publication.

G. PROVISIONAL RESULTS OF THE VARIATION OF LATITUDE AT PULKOWA DURING THE YEARS 1915.8–1929.0.

(Reported by Dr N. Dneprovsky in the General Assembly at Cambridge, U.S.A.)

Fraction of year	Year							
	1915	1916	1917	1918	1919	1920	1921	1922
	"	"	"	"	"	"	"	"
·0	—	+ ·09	+ ·19	+ ·23	+ ·13	− ·04	− ·10	+ ·02
·1	—	− ·05	+ ·06	+ ·17	+ ·10	− ·04	− ·16	− ·04
·2	—	− ·18	− ·08	·00	+ ·05	− ·03	− ·14	− ·11
·3	—	− ·22	− ·20	− ·09	·00	− ·01	− ·10	− ·17
·4	—	− ·19	− ·24	− ·14	− ·04	+ ·04	− ·05	− ·15
·5	—	− ·09	− ·14	− ·12	− ·03	+ ·10	+ ·05	− ·06
·6	—	+ ·07	·00	− ·03	+ ·03	+ ·13	+ ·17	+ ·08
·7	—	+ ·23	+ ·12	+ ·05	+ ·06	+ ·14	+ ·21	+ ·24
·8	(+ ·32)	+ ·34	+ ·19	+ ·10	·00	+ ·12	+ ·16	+ ·23
·9	+ ·21	+ ·30	+ ·23	+ ·14	− ·03	+ ·04	+ ·07	+ ·15

Fraction of year	Year						
	1923	1924	1925	1926	1927	1928	1929
	"	"	"	"	"	"	"
·0	+ ·05	+ ·14	+ ·07	+ ·05	+ ·01	− ·01	(− ·01)
·1	− ·05	+ ·04	+ ·05	+ ·03	+ ·01	− ·02	
·2	− ·15	− ·05	+ ·02	− ·01	·00	− ·04	
·3	− ·22	− ·12	− ·03	− ·06	− ·01	− ·06	
·4	− ·19	− ·16	− ·07	− ·10	− ·02	− ·06	
·5	− ·11	− ·14	− ·07	− ·09	− ·03	− ·06	
·6	+ ·01	− ·10	− ·02	− ·06	− ·03	− ·05	
·7	+ ·12	− ·02	+ ·05	− ·03	− ·01	− ·02	
·8	+ ·19	+ ·04	+ ·08	− ·01	·00	− ·01	
·9	+ ·20	+ ·06	+ ·07	+ ·01	·00	− ·01	

The influence of a diurnal term of a form $\Delta Z = 0''·05 \cos (t_\odot - 229°)$ is eliminated in the above values; this was empirically found by Mr A. Drosd from the discussions of the above series of observations and of the observations of δ Cassiopeiae during 1904–05.

III

H. Recommendations from the Members

(*a*) The following recommendations by the American Section of the I.A.U. were communicated by Mr W. D. Lambert of the U.S. Coast and Geodetic Survey:

(1) It is desirable that the definitive reductions of the work of the international latitude service for the period 1913–21 be published as soon as possible. It is said that this work is practically completed and that publication is delayed solely by lack of funds. Under present circumstances this lack may be difficult to remedy but the publication of this work seems to me desirable enough to warrant a special effort to accomplish it.

(2) It is desirable that the various mean poles, to which the instantaneous pole has from time to time been referred, be carefully defined and the pole used in any given case be stated. The specification of the mean pole used is obviously important in any study that may be made of a possible secular displacement of the pole. In Geodesy astronomical latitudes and longitudes have from time to time been reduced to some mean pole, but evidently not always to the same pole. If astronomers would come to some agreement in the matter, geodesists would be glad to follow their lead.

(3) It is desirable that investigation of possible short-period lunar terms in the latitude be continued. Stetson has used long series of observations and has found such terms, but his results are so difficult to explain on theoretical basis and are so out of harmony with the results of other investigations using similar observational material and with the result of earthtide investigations and those of the lunar variation of gravity, that the matter cannot be considered as settled.

(*b*) *The resolution passed by the National Committee of Astronomy in Italy, communicated by Professors Carnera and Peisino*

The following is the direct copy of the resolution passed by the National Committee of Astronomy in Italy:

"An den Hochgeehrten Herrn Vorstand der XIX Kommission

Prof. Doctor H. Kimura.

Es ist Allen wohl bekannt, dass es in Folge der Entschlüssen der Versammlungen der 'International Astronomical Union' und der 'International Geodetical and Geophysical Union,' die im Mai 1922 in Rom stattgefunden haben, ein Central-bureau unter der Leitung des Herrn Prof. Kimura in Mizusawa gegründet worden ist, um die Beobachtungen der Breitenstationen von Mizusawa, Carloforte und Ukiah berechnen, und die Polwanderungen seit dem 6 September 1922 ableiten zu können.

Der Prof. H. Kimura hat seit damals eine grossartige Arbeit ausgeführt, und es sind nicht nur die Polkoordinaten abgeleitet, sondern auch andere wertvolle Untersuchungen ausgeführt worden, die leider nur in sehr gedrengter Form veröffentlicht worden sind. Während wir aber die vollständigen Resultate der Beobachtungen der Breitenstationen von 1899 bis zum 1912 besitzen, und in kurzer Zeit, hoffentlich noch vor der Versammlung der I.A.U. in Boston, auch diejenigen Resultate der Beobachtungen bis September 1922 haben werden, sind wir bis jetzt in Besitz von ganz wenige Elemente der Beobachtungen der dritten Periode, die gerade mit musterhaften Sorgfalt von Prof. Kimura bearbeitet worden sind. Wenn wir nun eben beachten, dass in den letzten Zeiten Veröffentlichungen erschienen sind, in welchen aus den Resultaten der Beobachtungen der ersten Periode kurzperiodische

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Polschwankungen festgestellt worden sind, die von der Mondlage abhängig sein sollen, und dass es wünschenswert wäre solche Untersuchungen fortzusetzen; wenn wir bedenken dass selbst die Resultate, die von dem Herrn Prof. Kimura abgeleitet worden sind, noch unerklärte Erscheinungen zeigen, z.B. die systematischen Unterschieden zwischen den Polkoordinaten, die aus den 'Evening' und 'Morning Group' abgeleitet werden, so scheint es sehr wünschenwert, dass es auch für die dritte Periode eine ähnliche ganz ausführliche Veröffentlichung erscheine, so dass es möglich sei nicht nur die grossartige Arbeit des Herrn Prof. Kimura überallbekannt zu machen, sondern auch um Beobachtungsresultate für eventuelle weitere Untersuchungen liefern zu können.

Der Italienische Comite für Astronomie, im Einverstandniss mit der Italienischen Geodätischen Kommission, drückt deshalb [von dem grossen wissenschaftlichen Wert einer solchen Veröffentlichung überzeugt] den Wunsch aus, dass es sobald als möglich dem Herrn Prof. Kimura die Mittel zur Verfügung gestellt seien, um eine möglichst vollständige Ausgabe der bis jetzt ausgeführten Reduktionen der Beobachtungen der Breitenstationen zu veröffentlichen, und gleichzeitig um seine Untersuchungen fortsetzen zu können. Somit wird es endlich möglich sein die lobenswürdige Arbeit des Herrn Prof. Kimura der ganzen Welt bekannt zu machen, und gleichzeitig werden auch andere Gelehrten im Stande seine eventuelle andere Untersuchungen auszuführen.

Im Namen des Italienischen Comite für die Astronomie erlauben sich deshalb die Unterzeichneten den Herrn Vorstand der XIX Kommission zu bitten, bei der Gelegenheit der nächsten Versammlung der I.A.U. einen Vorschlag in diesem Sinne machen zu wollen.

Triest, den 9 November 1931.

Prof. Luigi Carnera,
Giovani Peisino."

(c) *Proposal from Dr H. Kimura with regard to the change of the Star-Programme for the North International Parallel*

(1) The question of the change of star-programme for the north parallel is an important one which could not wait till the next general meeting. At the outset in choosing stars for the latest series, special considerations were paid to the point that the series might be continued as long as possible with no interchange of star. It became, however, necessary to interchange some few pairs with new ones owing to precession. The proper time for their interchanges would be the epoch 1934.7, though they may be safely observable still longer; but I fear that a slight failure in the setting of a telescope might sometimes make the observations impossible, the star running out of the limit 0–30 revolutions of the micrometer. Thus during just 12 years one and the same series would be continued: the number 12 is merely arbitrary but is chosen to avoid the risk of unobservable cases above explained. About the beginning of the international service the cycle of the polar motion was about 6 years, but since about 10 years ago it has increased to about 9 years, owing to the mutual cancelling of two principal terms, namely—the Chandler Period and the period of 302°. At any rate, a partial interchange of star-pairs, or alternatively another better star-list is needed. I should prefer the first, and would suggest the following programme:

The number of groups to be 12 as in the present programme, but the number of

pairs contained in each group to be reduced to 6, and no star fainter than 7·0 magnitude to be chosen. The observing programme to remain the same.

The reasons for the above modification are already given in the preceding article D. It is desirable that, as the weather conditions throughout the winter season in all north stations are unfavourable, if possible the number of pairs contained in the group which are to be observed in that season should be more than 6, but unfortunately this desire could not be satisfied owing to the scantiness of the appropriate stars in the corresponding right ascensions. Thus there is no help but to increase the weight of the observations in winter, unless the entire system of the programme is altered.

(2) The publication of the results since 1912 up to the present time is urgently requested from the investigators concerned not only in the study of the variation of latitude but also of the secular change of the pole, the short period of the lunar influence, etc. Fortunately the publication for the epoch 1912–1922.7 is nearly finished as given in article F. The publication following the year 1922.7 under my supervision was urged by Prof. Shin Hirayama some years ago, as now by the Italian Committee. The recalculation of all observations in the three stations is begun already, but owing to the abundant material over many years and to the method of successive approximations, slight corrections become necessary one after another, so that the work did not proceed as I expected at first, but it may be completed within half a year.

Next, the most important question is the publication of the above results. And for realizing it, the aid of the I.A.U. is most cordially requested, as the Italian Committee has agreed to by the second letter to me.

I. Activities of the Central Bureau at Mizusawa

The present work in the Central Bureau is as follows:

(1) Reductions of the observations at all the north and south international stations;

(2) Calculations of the daily apparent declinations for all star-pairs at the time of transit at Greenwich, for the north and south international schemes;

(3) The same at the time of transit at Batavia, for the Batavia Station;

(4) Deductions of the path of the polar motion from the results of the north international parallel;

(5) The comparisons of all results at the latitude observatories in free co-operation with those of the international scheme;

(6) As temporary work, the evaluations of each individual value of latitude observed at the three old stations, namely, Mizusawa, Carloforte and Ukiah during about 8 years 1922.7–1931.0, treated under a general and uniform system; and at the same time, deductions of the second approximate values of the co-ordinates of the polar curve, and Z and declination-errors separately. In addition, the determination of the errors for the adopted values of the proper motions of all pairs has been attempted from the latitude observations themselves.

J. Report on the Financial Position

During the past four years, the Central Bureau of the International Latitude Service at Mizusawa has received the following grants from the International

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Astronomical Union and the Geodetic Section of the International Geodetic and Geophysical Union:

From I.A.U			For the	From Geodetic Section	For the
£	s.	d.	year	Frs.	year
100	0	0	1929	7,000	1928
100	0	0	1930	7,000	1929
100	0	0	1931	7,000	1930
100	0	0	1932	7,000	1931
Total £400	0	0		Frs. 28,000	

H. KIMURA
President of the Commission

March 30, 1932

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