## **Results Of Research On Meterology**

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**Abstract**: Meteorology is the interdisciplinary scientific study of the atmosphere. Meteorological phenomena are observable weather events that are explained by the science of meterorolgy, I have conducted researches in the field of meteorology and invented some related discoveries & inventions which may also be useful in understanding the extent of the meterorolgy.

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Keywords: Cyclones, Low pressure systems, Monsoons

History: I have conducted many scientific researches on the Indian Monsoon during the period of 1980-91, and invented the Indian Monsoon Time Scale which can help to study the past, present and future movements of the Indian Monsoon. In 1991, Sri G. M. C. Balayogi, Member of Parliament (Lok Sabha) recommended the Indian Monsoon Time Scale to the India Meteorological Department for implementation in the services of the country. In 1994, the cabinet secretary of India recommended the Indian Monsoon Time Scale to the Ministry of Science & Technology, Govt of India for implementation. In 1996, Many consultations were made with the parliament house, president of India and other VVIPS of India. In 2005, consultations were made with the India Meteorological Department about the Indian Monsoon Time Scale for further research and development in the services of the country. In 2009, the Secretary, Minister of science and technology was also recommended the Indian monsoon Time scale to the Indian Institute of tropical Meteorology for research and development.

**Construction:** The Indian Monsoon Time Scale-a chronological sequence of events arranged in between time and weather with the help of a scale for studying the past, present and future movements of monsoon of India and its relationship with rainfall and other weather problem and natural calamities.

Prepare the Indian Monsoon Time Scale having 365 horizontal days March 21<sup>st</sup> to next year March 20<sup>th</sup> of a required period comprising of a large time and weather have been taken and framed into a square graphic scale. The main weather events if any have been entering on the scale as per date and month of the each and every year. If we have been managing the scale in this manner continuously we can study the past, present and future movements of the Indian Monsoon.

For example, I have prepared the Indian Monsoon Time Scale by Preparing the Scale having 365 horizontal days from 1<sup>st</sup> April to next year March 31<sup>st</sup> of 128 years from 1888 to 2016 for the required period comprising of large time and weather have been taken and framed into a square graphic scale. The monsoon pulses in the form of low pressure systems over the Indian region have been entering on the scale in stages by 1 for low, 2 for depression, 3 for storm, 4 for severe storm and 5 for severe storm with core of hurricane winds pertaining to the date and month of the each and every year. If we have been managing the scale in this manner continuously, we can study the past's present's and future's of the India monsoon and its relationship with rainfall and other weather problems & natural calamities in India.

Analysis: The Indian Monsoon Time Scale reveals many secrets of the monsoon & its relationship with rainfall & other weather problems and natural calamities. For example, some bands, clusters and paths of low pressure systems along with the main paths of the Indian Monsoon (South-east monsoon and north-west monsoon) clearly seen in the map of the Indian monsoon it have been some cut-edge paths passing through its systematic zigzag cycles in ascending and ascending order which causes heavy rains & floods in some years and droughts & famines in another years according to their travel. For example, during 1871-1990's the main path of the Indian monsoon was rising over June, July, August and creating heavy rains and floods in most years. During 1900-1920's it was falling over August, September and causing low rainfall in many years, During 1920-1965's, it was rising again over July, August, September and resulting good rainfall in more years. During 1965-2004's it was falling over September and causing low rainfall and droughts in many years. At present it is rising upwards over June, July, August, and will be resulting heavy rains & floods in coming years during 2004-2060. The tracking date of main path & other various paths such as south-east monsoon and north-west monsoon etc., of the Indian Monsoon

denotes the onset of the monsoon, monsoon pulses or low pressure systems. And also we can find out many more secrets of the Indian monsoon such as droughts, famines, cyclones, heavy rains, floods, real images of the Indian Monsoon, and onset & withdrawals of south east monsoon and north-west monsoon etc. by keen study of the Indian Monsoon Time Scale.

**Principle:** This is an Astrogeophysical/ Astrometeorological Phenomenon of effects of astronomical bodies and forces on the earth's geophysical atmosphere. The cause is unknown however the year to year change of movement of axis of the earth inclined at 23 1/2 degrees from vertical to its path around the sun does play a significant role in formation of clusters, bands & paths of the Indian Monsoon and Stimulates the Indian weather. The inter-tropical convergence zone at the equator follows the movement of the sun and shifts north of the equator merges with the heat low pressure zone created by the rising heat of the sub-continent due to the direct and converging rays of the summer sun on the Indian Sub-continent and develops into the monsoon trough and maintain monsoon circulation.

**Experiments Carriedout:** Many experiments were carried out on the Indian Monsoon Time Scale and Successfully proved out in practice.

**Publications:** Many journals announced the Indian Monsoon Time Scale In 2004, a news commentary was published in the popular daily Vartha. The journal of environmental & ecology announced the Indian Monsoon Time Scale and Global Monsoon Time Scale in 2015.

**Concluisions:** We can make many more modifications thus bringing many developments in the Indian Monsoon Time Scale.

**Indian Weather Time Scales:** I have conducted many extensive researches on the astronomical forces and its effects on the earth climate particularly on various regions of the India. The variations in the solar cycle affects and stimulate the earth climate. The moon affects and stimulate the ocean tides and atmosphere too. The movement of axis of the earth inclined at 23  $\frac{1}{2}$  degrees from vertical to its path around the sun affects and stimulate the earth weather and leads to formation of monsoons and seasons etc. So the astronomical forces affect and stimulate the earth climate the earth climate it may be more or less but it is true. These scales may be taken as a part of scientific study of astronomical forces & its effects on the earth climate.

In the time and scale of the universe some things from astronomy to atom including living beings have been repeating once in every certain time or period. For example, the south and north magnetic poles have been shifting in every certain period. The sun spots have been repeating once in every eleven years. The lunar and solar eclipses have also been occurring once in every 18.6 years. The seasons such as winter, autumn etc. also have been repeating once in every year in the same month of the year. The periodical menses in the females repeating once in every month.

On the basis of the said universal facts, I have prepared a time scale with 21 blocks, each block containing certain prescribed cycle of years in which similar calendar years repeating one after another that leads similar weather conditions of those previous years to future years likely repeating every year approximately. The rainfall of the years, have been entering in the scale in percentages or as it is pertaining to month, season, annual wise of the each and every year. If we managing the scale in this manner continuously, we may assuming the weather conditions of the anterior years on the basis of the posteriors years weather. On the basis of the principle, we can assume that a considerable, of course it may be little chance of predication for an ensuing years by study the data of earlier years.

I have prepared a model Indian weather time scale along with hundreds of additional scales (1617 scales, 12 months, 4 seasons, 50 regions & 150 above years were studied) in which all weather conditions such as rainfall, temperature, cyclones, river water etc of all homogeneous regions sub-divisions of India were studied and analyzed elaborately.

### **Studies Carried Out :**

Firstly, see the Indian weather forecasting study model time scale. In this scale, the June, July, August and September months of the summer monsoon season were taken in a table in which the each month is also divided into three parts the Telangana, Rayalaseema and Coastal Andhra regions. The monthly wise rainfall data of the months of the regions from 1870 to till available years are taken in the form of percentages or as it is and entering in the scale pertaining to the region wise of the each and every year. If we managing the scale in this manner continuously, we may assuming the weather conditions of the anterior years on the basis of the posterior years weather.

Example for assuming the dry season or suppose to predict the rainfall situation in the summer season of the ensuing year 2019: study the 7<sup>th</sup> cycle in which wet conditions in 10 years and dry conditions in 14 years were occurred in the month of June : wet conditions in 2 years and dry conditions in 22 years were occurred in the month of July : wet conditions in 4 years and dry conditions in 20 years were occurred in the month of August and wet conditions in 8 years and dry conditions in 16 years were occurred in the month of September. On the whole, wet conditions in 24 times and dry conditions in 72 times repeated in the summer monsoon season of the 7<sup>th</sup> cycle (As a result, there were dry conditions occurred in the 2002 year also). Therefore it is a considerable chance to predict that a dry season will be repeated in the ensuing year of 2019.

Example for assuming the wet season or suppose to predict the rainfall situation in the summer season of the ensuing year 2022: study the 10<sup>th</sup> cycle in which wet conditions in 13 years and dry conditions in 8 years were occurred in the month of June: wet conditions in 13 years and dry conditions in 8 years were occurred in the month of July: wet conditions in 9 years and dry conditions in 12 years were occurred in the month of August and wet conditions in 19 years and dry conditions in 2 years were occurred in the month of September. On the whole, wet conditions in 54 times and dry conditions 30 times were repeated in the summer monsoon season of the 10<sup>th</sup> cycle. As a result, there were wet conditions occurred in the 2005 vears also. Therefore, it is a considerable chance to predict that a wet season will be occurred in the ensuing year of 2022.

In the same manner, we can study the remaining all Indian weather time scales of all Indian Homogeneous regions and subdivisions, states and districts of India.

We can make many more modifications thus bringing many more developments in the Indian weather time scale and its all additional Indian weather time scale.

**Bioforecast:** I have invented the bioforecast effect in 1965 by keen study and observations of the biolumicells. Although weakened by forecasting property with less successive rate, it is a primary and natural forecasting method. This is my third invention which can help to forecast the weather changes 18 days in advance.

I first started the researches in 1963-65 @ 5 to 7 years age with little instruments such as papers and pencils, water drop etc. and invented the light spot scope (Liposcope). Liposcope is a simple but wonderful instrument which functions with a natural doctrine hidden secretly in the function of the eye which can help to find out some inventions and discoveries like biolumicells, bioforecast effect etc, Liposcope is my first invention.

Construction: Take one small glass/steel ball or water drop on an object and stand in sun the light. Expose the ball/drop to the sun rays. As a result of the sun rays, there will be a light spot in the drop/ball. Place the light spot closely to the eye. The light spot appearance in the screen of light spot is the surface of the eyeball. This can be proved by moving eyelids, the movement of eyelids, eye water and some bioluminescent particles on the eyeball can be observed in the screen of light spot.

Principle: The principle of the lisposcope is that the eye lens changes its focal length from a minimum distance to the object at infinity and can see the object. If the distance decreases below minimum, the clarity of vision decreases. At this position, the eye lens acts as a simple microscope and form virtual images of all objects in front of it. We can see them on the screen of light spot if place just unside its minimum distance.

I have discovered the biolumicells (Bioluminescentmicells) on the eyeball in 1964 in the Lisposcope experiments. These particles are a part and parcel of the human body, may be released within the human body and secreting to the eyeball through the eye water. This is my second invention.

In the lipscope observations we can see three types of bioumicells on the eyeball the first one is the most bright and active and it is seen rarely on the eyeball and this biolumicell is has high velocity, mechanical energy, spin around itself it. The second one has normal bright seen normally on the eyeball and the third and last one is bright less, it is seen frequently on the eyeball.

Looking the screen of light spot and move the eyelids. We can see some biolmicells on the eyeball. After finding a number of biolumicells all at once in cloud or group, you must count them without eyelid movement. Firstly, observe with one eye two or three times. Later on another eye. As we examine one after another with both eyes, we have to take into account the greatest number of particles.

Analyze the data and make a table with the particulars-date of observation, time of observation, number of particles and weather report. Firstly we must put the date, next the time of observation, then the number of particles available in the observation. Do the observations three or four times daily in the morning & evening and record the number. At last, record the weather report of the country on the same day. If we do our observations and analyze in that manner, we can notice that there is a relation between the differences in particles number in the table and the changes in the weather after about 18 days. If the particles number is minimum the weather after 18 days will be normal. On the other hand if the particles number is at maximum there will be a change in the weather after 18 days.

Principle: The cause is unknown however it can understand that generally biolumicells secrete in less or minimum levels at normal weather conditions, but over the formation of low pressure weather conditions, biolumicells begin to secrete at maximum levels due to a fall in weather pressure on the human body.

Great Prediction: The important prediction of the bioforecast effect was proved in 1991. In 1991, the Andhra Pradesh state council of science & Technology, The Andhra Pradesh Remote Sensing Applications Centre and the Andhra Pradesh Science Centre were conducted experiments on the

relationship between the biosphere and atmosphere (explore the inter-connection of earths geomagnetic field with natural calamities and their effect on human impulse). In these observations, the maximum level of the biolumicells were recorded between 7<sup>th</sup> to 11<sup>th</sup> of April, 1991. It is the sign of the ensuring cyclone of the 28<sup>th</sup> April 1991. The three directors of the said institutions were met in the Andhra Pradesh state Council of Sciences & Technology on 9<sup>TH</sup>, April 1991 and discussed about the prediction. As predicted on 9th April 1991, in the meeting a severe cyclone was formed in Bay of Bengal and struct the Bangladesh on 28<sup>th</sup> April 1991. As a result, thousands of people were killed and crores of rupees property was damaged. This is the great prediction by the bioforecast and the remaining predictions were weak.

**Conclusion:** We can make many more changes thus bringing many more changes in the bioforecasting scale.

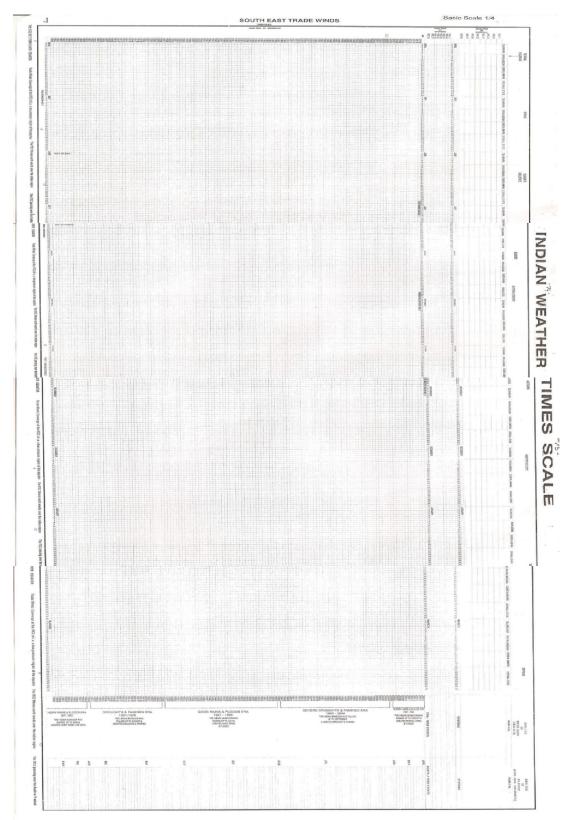
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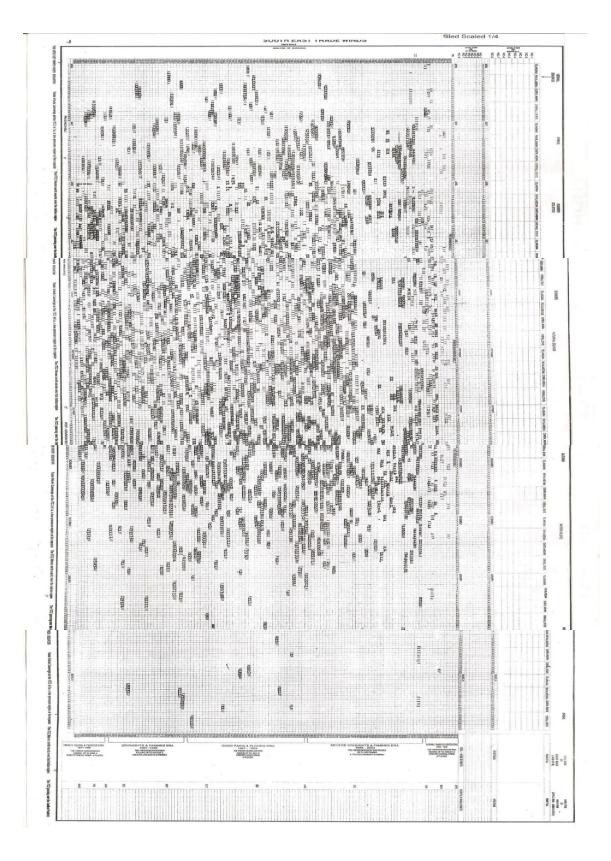
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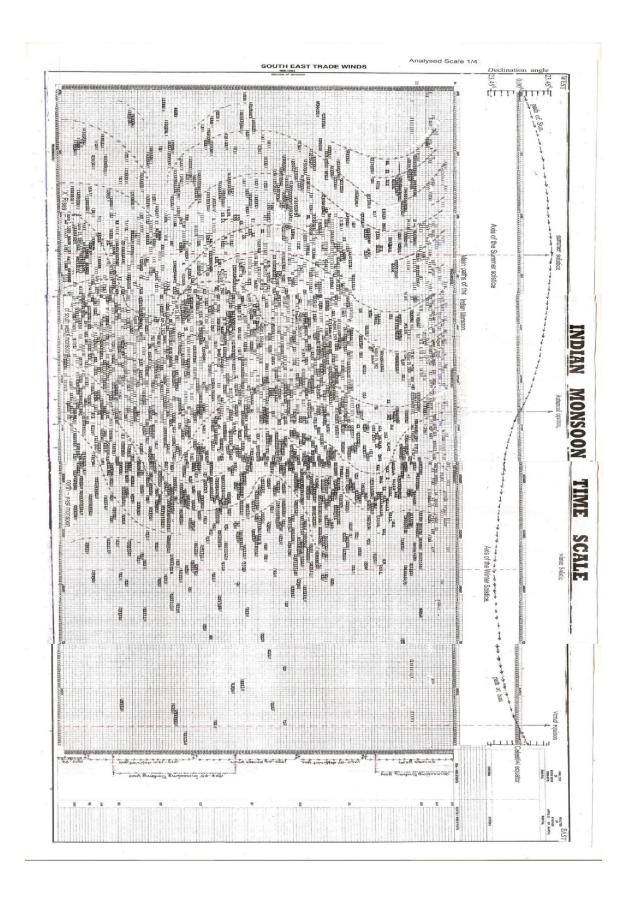
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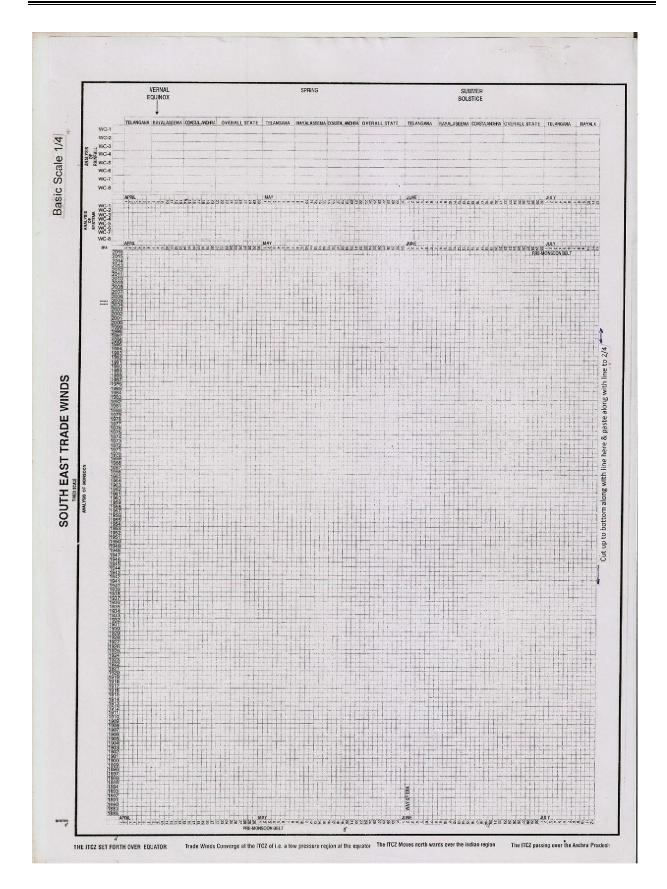
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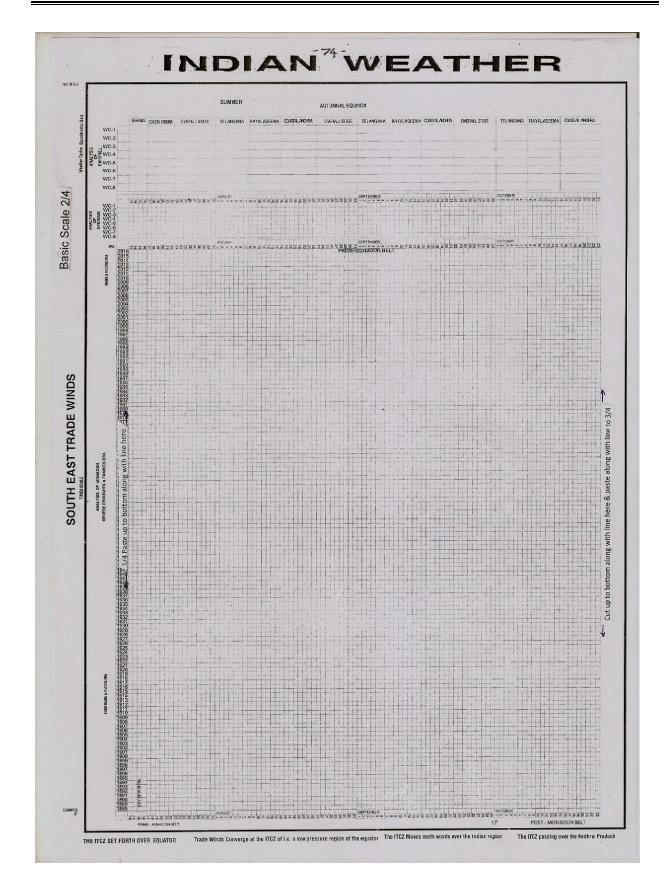
# Appendices: Indian Monsoon Time Scale

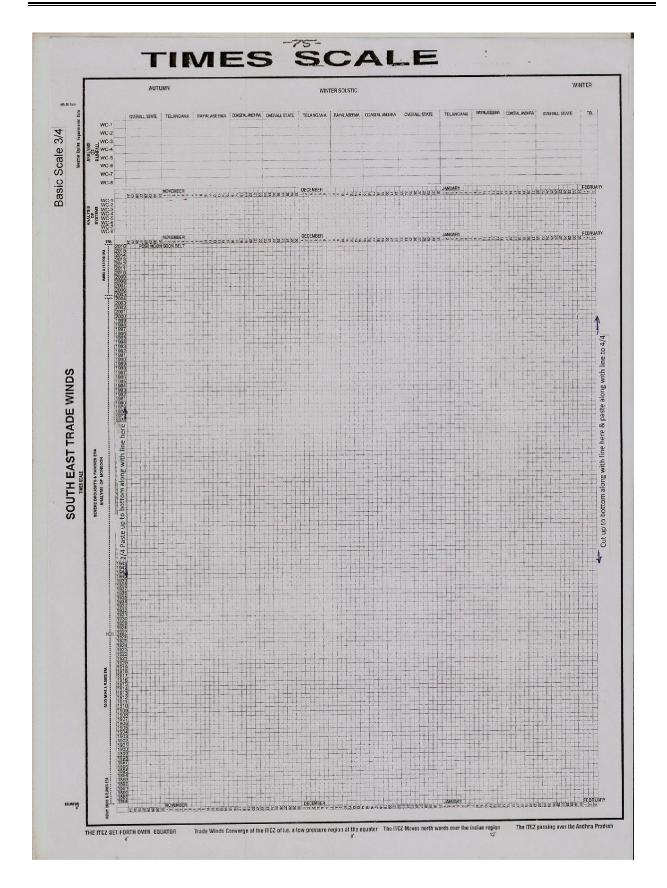


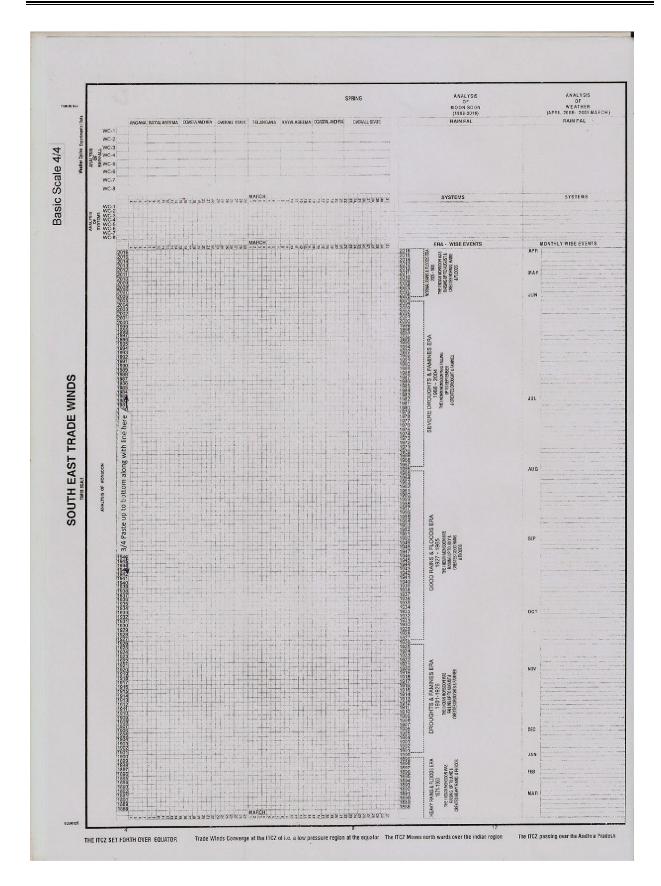


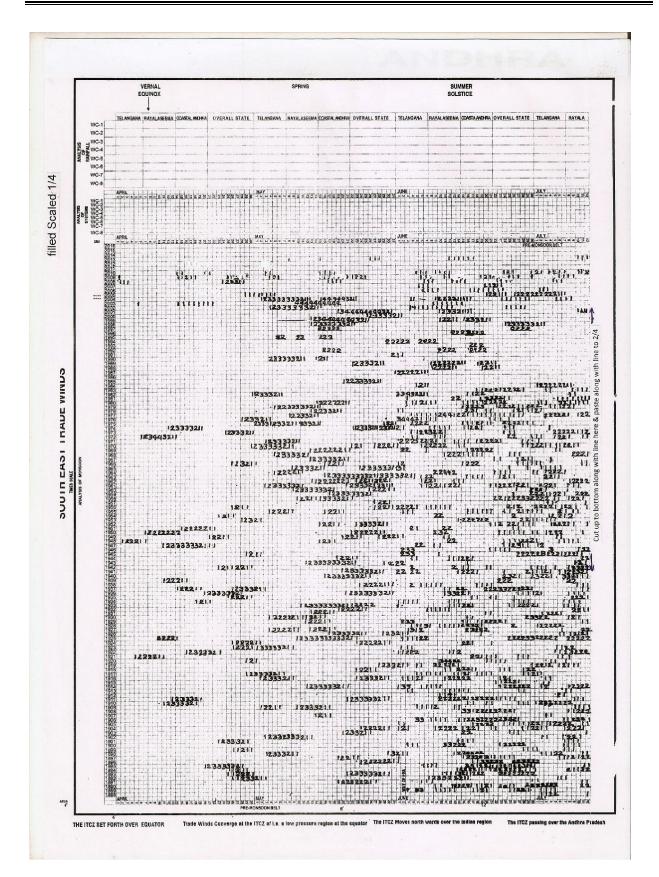


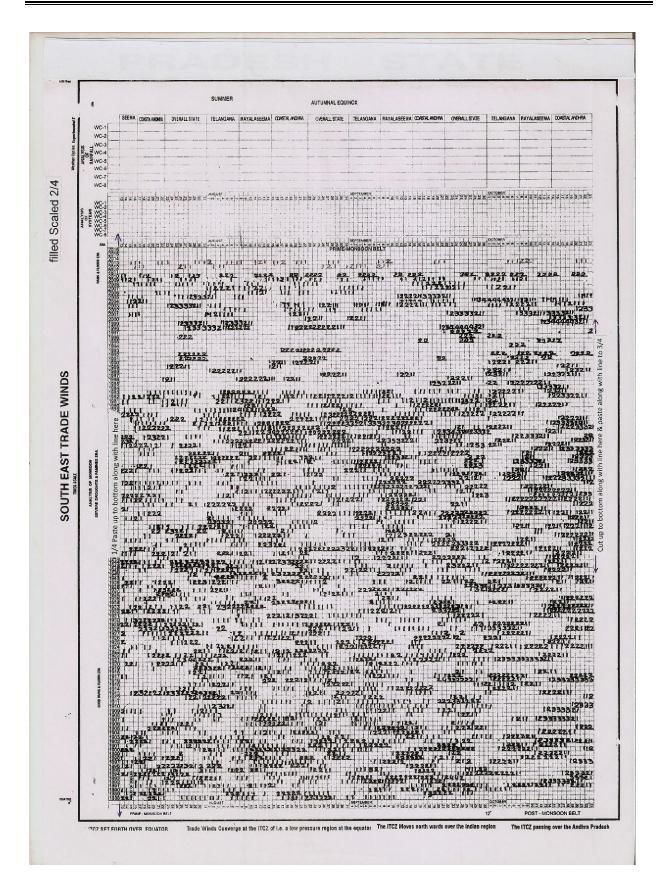


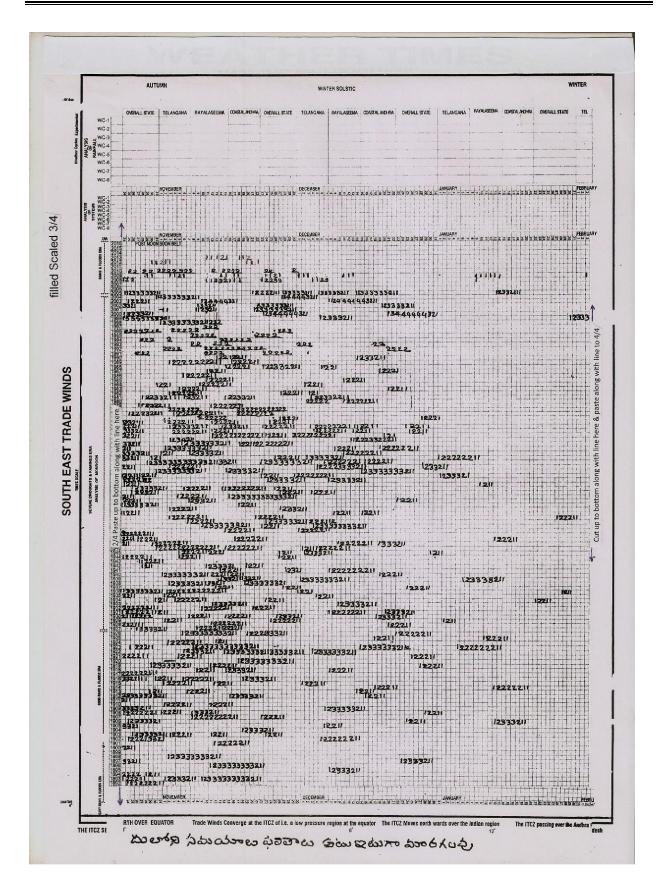


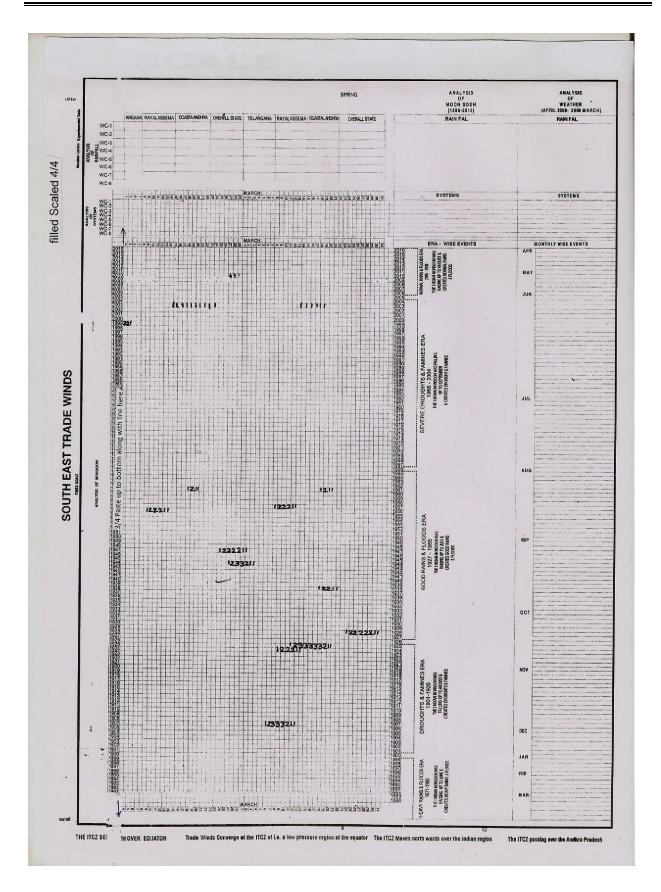


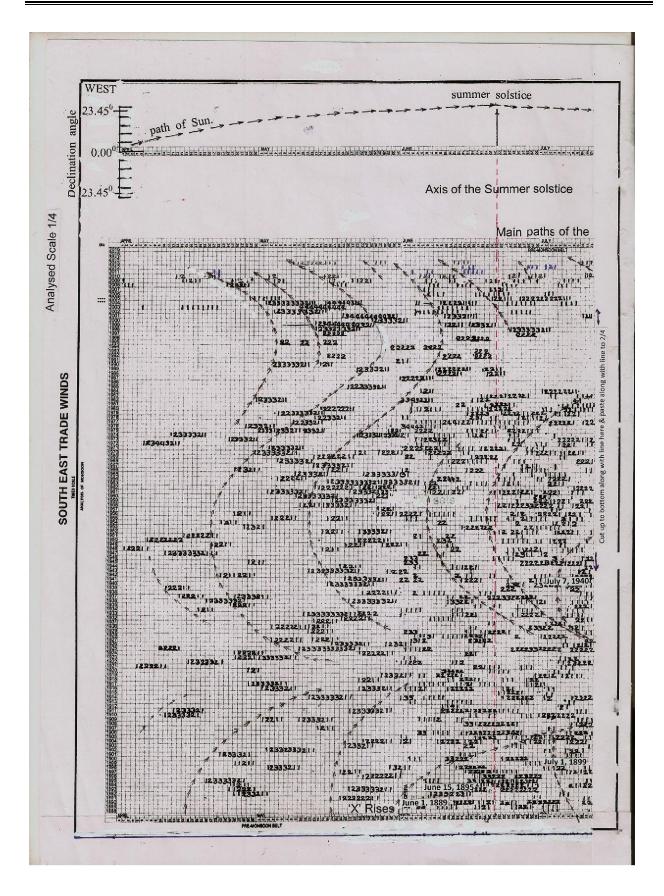


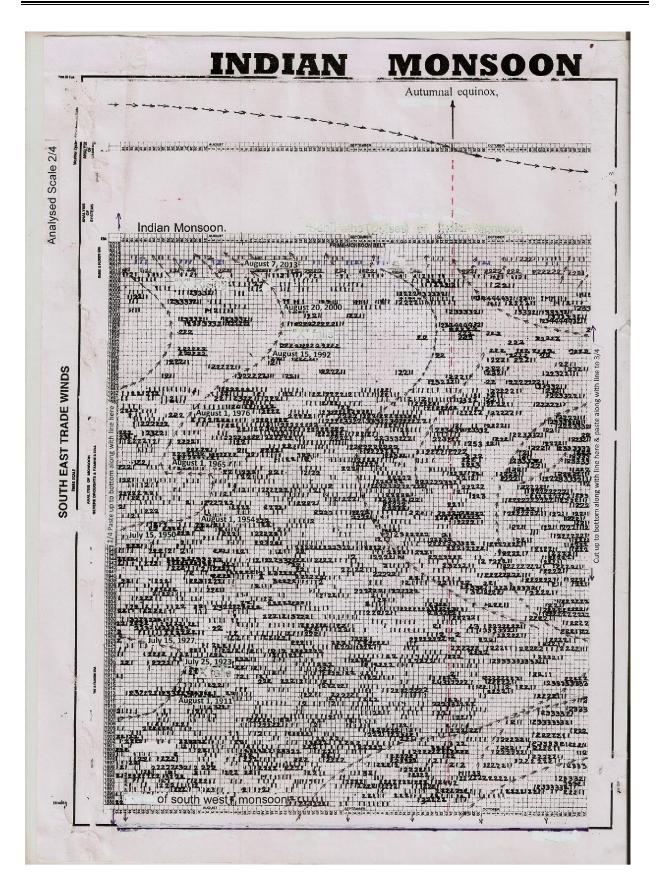


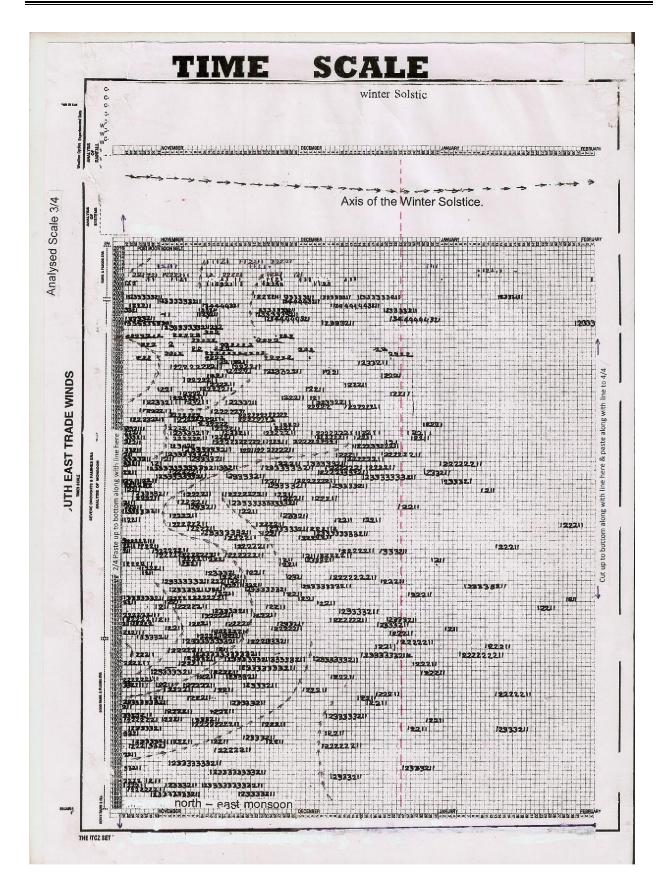


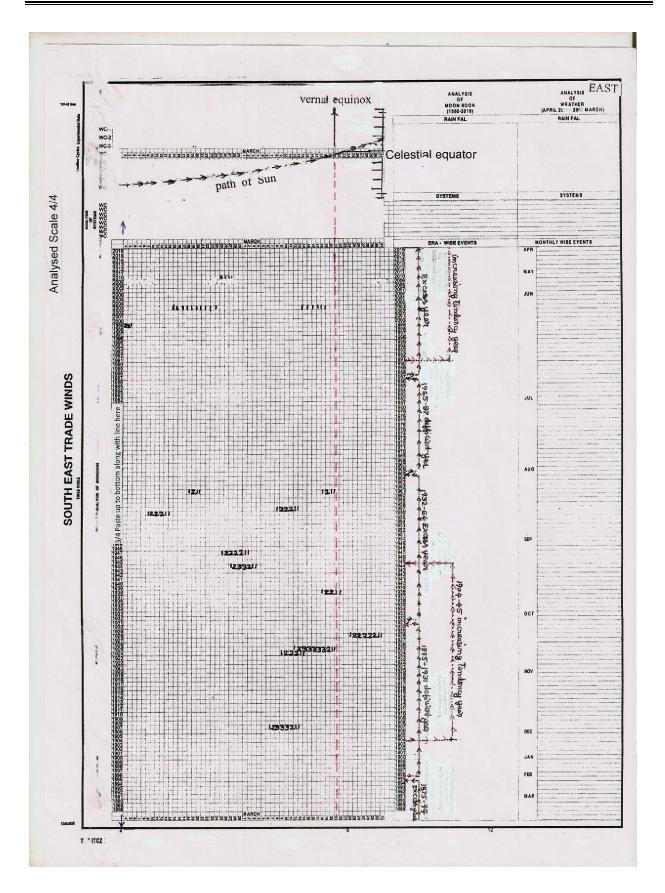


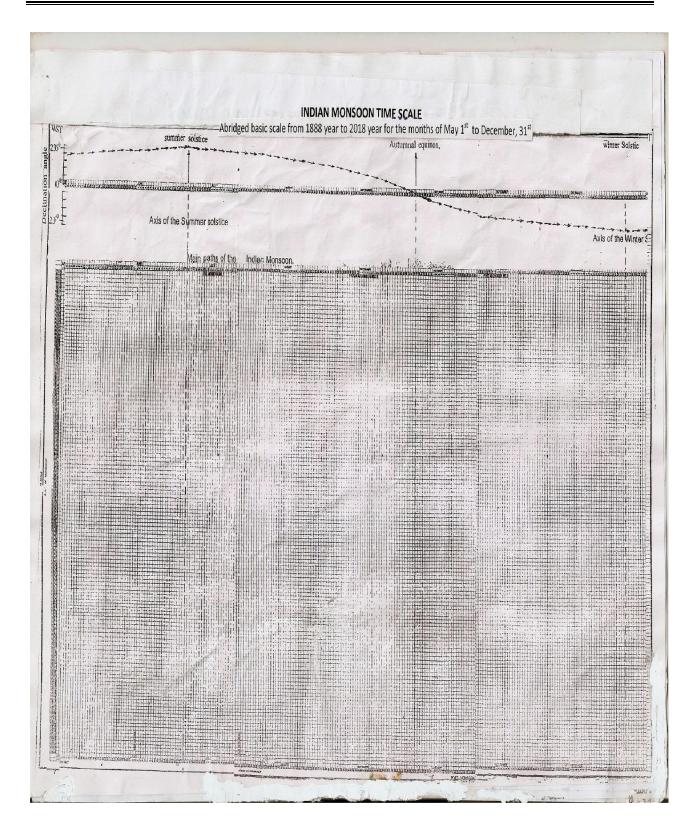


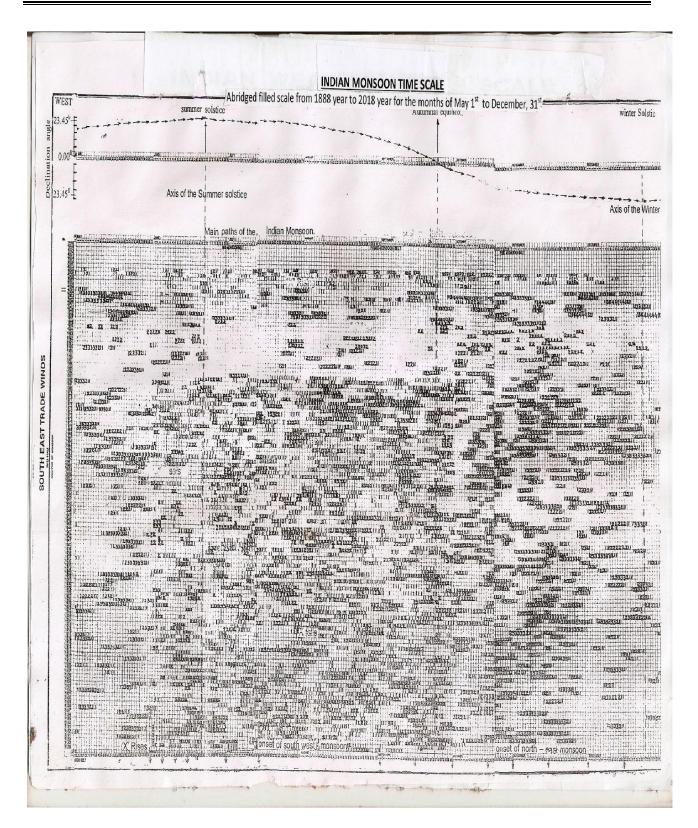


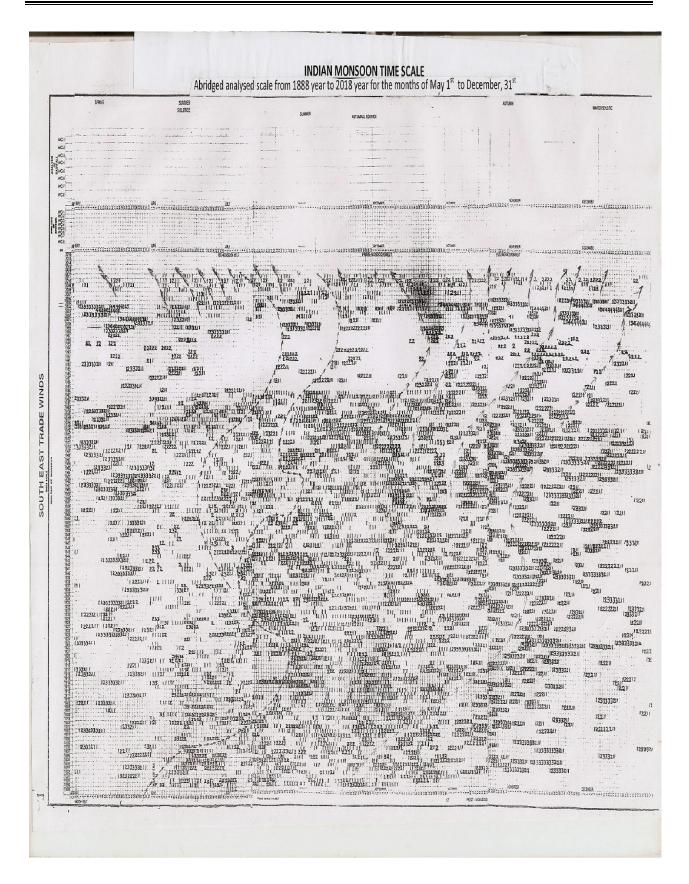


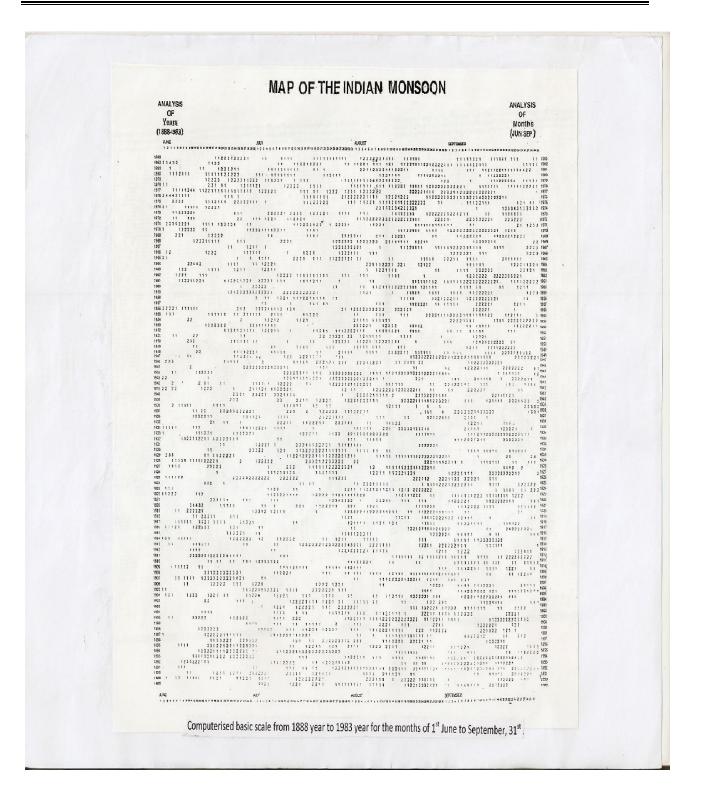




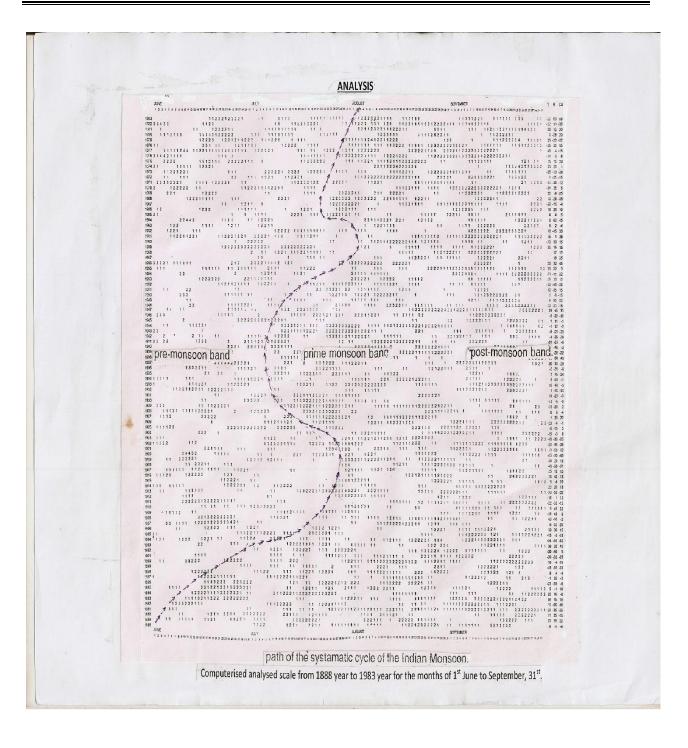


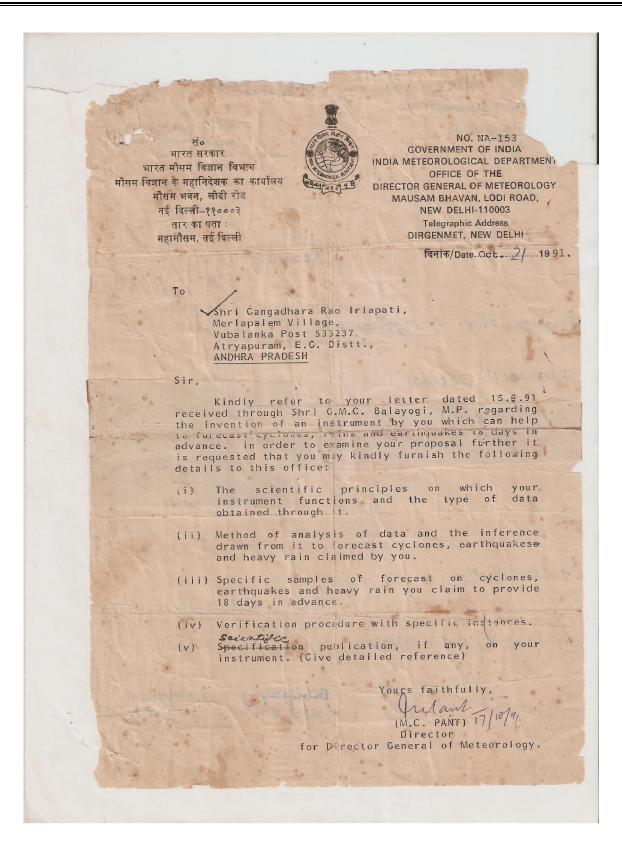






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, S, GHOSE, Joint Secretary भारत सरकार विज्ञान सौर प्रौद्योगिकी संत्रालय विज्ञान स्रौर प्रौद्योगिकी विभाग <sup>टेक्नोबाजी घवन, नया महरोकी मार्ग, तर्द दिल्ली-११००१६ GOVERNMENT OF INDIA MINISTRY OF SCIENCE & TECHNOLOGY Department of Science & Technology</sup>

Technology Bhavan, New Mehrauli Road, New Delhi-110016

DO No.NMRF/SKM/30/94

Dated: 17.8.1994

Dear Dr. Naidu,

Please refer to your letter No.1152/ADB/2/94 dated May 19, 1924 addressed to Cabinet Secretary forwarding representation of Shri 1 Gangadhara Rao, Junior Assistant in the Andhra Prach Public Service Commission regarding his claim of invention of a peculiar scale for forecasting cyclones, heavy windy rain, earthquakes and all other natural calamities 16 days in advance.

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We appreciate the attempt made by Shri Gangadhara Rao in developing a weather scale using a complete new approach. However you will agreee that a weather forecasting scheme ought to have some scientific basis and be capable of delivering results independent of an individual observer. Since the scale developed by Shri Rao uses eye as an instrument, whose property and efficacy varies from person to person as also from age to ag. if the observer, it can not be a reliable tool for the purpose. Studies in geomagnetrom establish no relationship between the occurence of cyclones and change in geomegnetic fi Further, the fore-SHERY to be valid for an area on 100 to 1500 kms around cast is he Wide, of observation. The range being . O wide, it is doubt-It such a forecast, even if true an arve any worthwhit ose like fore-warning the people in affected area, takin recautionary measure or planning any emaggency relief with eating panicky condition

vam: SCIENCTECH 🗆 Telephone : 662826 (PABX)/667373 (EPABX) 🗋 Telex : 73381, 73317, 73280 🗂 Fax : 665145, 666241

सं•

भारत सरकार

भारत मौसम विज्ञान विभाग

मौसम बिज्ञान के महानिदेशक का कार्यालय

मौसम भवन, लोदी रोड

नई दिल्ली-११०००३

तार का पता :

महामौसम, नई दिल्ली

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То

Shri Gangadhar Rao Irlapati, C/o K. Chiranjeevi, H.No. 28-3, Saibabanagar, Judimetta, Hyderabad.

Subject:- Request for forwarding the copies of representation to President of India and other VVIP.

Sir,

Kindly refer to your letter dated September 12, 1996 addressed to the Secretary, Lok Sabha Secretariat, Parliament House, New Delhi on the subject quoted above.

In this connection, your are requested to kindly refer our 'earlier letters of even number dated 8.6.95 and 8.1.96 in which you were advised suitably for your weather prediction device and recruitment in the Central Government establishment as well. You may proceed accordingly in your future action.

Yours faithfully,

28/11/96

(S.C.'GOYAL) Director for Director General of Meteorology

tio NO. 49106 53 भारत सरकारं भारत मौसम विज्ञान विमाग INDIA METEOROLOGICAL DEPARTMENT मौराम विज्ञान के महानिदेशक का कार्यालय OFFICE OF THE DIRECTOR GENERAL OF METEOROLOGY मोसम भवन, लोयी रोड, -MAUSAM BHAYAN, LODI ROAD नई दिल्ली-१.१०००३ NEW DELHI-110003 तार का पता : Telegraphic Address : गहागीलग, नई दिल्ली DIRGENMENT, NEW DELHI दिनांक/Date ... 2. 5. 0.7. To: Shri Gangadhara Rao Irlapati, . H.No.5-30-4/1, Saibaba Nagar, Jeedimetla, Hyderabad. Andhra Pradesh Pin.Code No. 500 055. Sub:- Project proposal to forecast drought, monsoon and rainfall etc. Sir, Kindly refer to your letter, regarding the project proposal for forecast the droughts, monscon positions and rainfall etc. with the help of scale of data. You are requested to submit the project to Deptt. of Science and Technology (DST) through proper channel for necessary action. M hey & ETM (M. Satya Kurnar) Director Aviation Service For Director General of Meteorology

डा.टी.रामसामी

सचिव

Dr. T. RAMASAMI

SECRETARY

No. DST/SECY/. २. १. १२००९<br/>भारत सरकारविज्ञान और प्रौद्योगिकी मंत्रालय<br/>विज्ञान और प्रौद्योगिकी विभागटेक्नोलाजी भवन, नया महरौली मार्ग, नई दिल्ली-110 016<br/>GOVERNMENT OF INDIA<br/>MINISTRY OF SCIENCE & TECHNOLOGY<br/>DEPARTMENT OF SCIENCE & TECHNOLOGY<br/>Technology Bhavan, New Mehrauli Road, New Delhi-110 016

June 1, 2009

### Dear Shri Irlapati Rao,

I receive your letter of 11<sup>th</sup> May, 2009. Thank you. You may be aware that IITM is currently under the administrative control of Ministry of Earth Sciences. However, I have written to the Director, IITM requesting him to dos the feasible in consultation with their Secretary.

Kindest regards,

Yours sincerely,

Manneson

(T. Ramasami)

Shri Gangadhara Rao Irlapati Asst. Section Officer A.P. Public Service Commission (Beside Gandhi Bhavan) Nampally, Hyderabad 500 001

Tel.: 0091-11-26510068 / 26511439 • Fax: 0091-11-26863847 / 26862418 • E-mail: dstsec@nic.in

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No. F-12016/1/00-NA/100

भारत सरकार भारत मौसम विज्ञान विभाग मौसम विज्ञान के महानिदेशक का कार्यालय मौसम भवन, लोदी रोड, नई दिल्ली-110003 तार का पताः महामौसम, नई दिल्ली दूरभाषः 24611068, 24631913



GOVERNMENT OF INDIA INDIA METEOROLOGICAL DEPARTMENT OFFICE OF THE DIRECTOR GENERAL OF METEOROLOGY MAUSAM BHAWAN, LODI ROAD, NEW DELHI-110003 Telegraphic Address: DIRGENMET, NEW DELHI Tel. No. 24611068/ 24631913, Fax No. 24643128,

November, 2009.

Shri Gangadhara Rao Irlapati A.S.O., A.P.P.S.C., Nampally, Beside Gandhi Bhawan, Hyderabad – 500 001, A.P.

Subject:- "Indian Weather Time Scale" - regarding.

Sir,

With reference to your letter addressed to Secretary, Ministry of Earth Sciences, regarding forecast relating to prediction of cyclone, monsoon, heavy rainfall etc., you may kindly refer this office letter No. 0-49106/537 dated 25/26.7.2005.

However, your dedication and interest in the field of meteorology is highly appreciated.

Thanking you,

Yours faithfully,

T & may . J.

(Awadhesh Kumar) Scientist `E' for Director General of Meteorology

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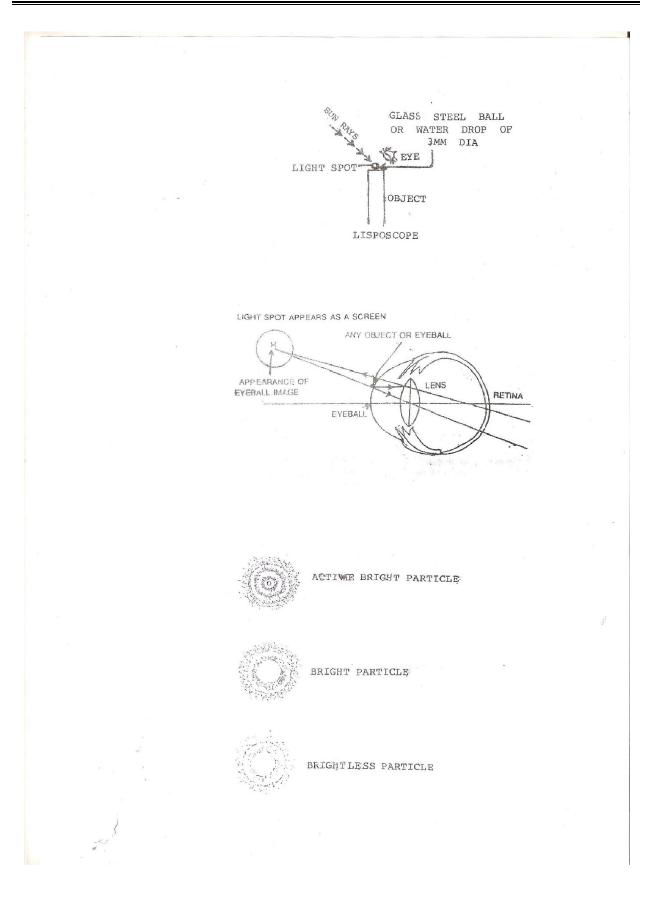
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1	1920	-39.6	-39.5	-42.8	-40.6		-99.4	+55.5							+62	+40		
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	1960		+5.97		-39.3		-17.2			+8.9		+109.0		+5	+50	+47		
1	1949	-26.3	+51.6	-8.4	-24.4	+13.7	+3.1					+94.1	+16.4	+1	+24	+23		
	1927	+55.6	+25.9	+34.2	+4.10	+26.3	-23.5	-35.7		-9.3					+45	+22		-
	1910	+81.6		+20	-36.6	+76.6	+2.1		+62.9			+55.2	+4.8	+10				-
	1893		+53.4		+10.5	+98.2	-55.1	+67.6		-10.6		-8.96	-56.6	+45	+16	+19		-
				+399.6		+31.0	+65.6		+6200		+65.4	+26.6	+714	-36	-7	-18		-
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	1989	+71.8		-20.3	+72.1	+26.5	+80.2	+2.64	-/9.6					+19	-10	+2		
	1967	+17.4	-25.4	-1.7	+51.5	+6.11	-0.4	-25.2		-55		+8	-16.7			-9		
	1950	-51.7		-40.7	-33.7	-20.8	-9.4	-67.6		-59.9		+11.3	+2.8	+1	-5			-
	1933	+87.3		-52.5	+116	-18.9	-6.9	-22.9		-29.6		-48.4	-32.1	+11	-11	-5		
				-22.9	-36.6	-26.4	-22.2	-28.4		-62.5	+1.00	-22	-13.5	-20	-32	-18		_
	1911		+3.47				-51.4	+14.6		-31.4		-17.3	-0.06	+19	+11	-7		
	1894	+7.8		-8.2	+25.4	+15.3				-56.3		+7.20	+21.4	-39	-19	+21		
	1877	-43.2	+5.41	-70	-75.6	-65.4	-53.4	-58.5	-40.0	50.0	1 10.0				1			
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12	2007															0		-
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	1973	+0.31		-33.6	-9.41	-29.8	-48.7	+42.2	+15.4	-19.9	-40.0	+10.1	-31.5	+1	-8	-21		-
							+28.6	-405		-26.4	-0.3	-33.6	-31.4	-10	-33	+11		
	1951	-17.0	-15.9	+3.1	-5.77	-7.8		+0.3		-18.8	+11.5	-62.4	-40.4	+5	-30	-1		
	1934	-3.04	+25.6			+27.0	+5.9			+3.2	+11.3	+22.0	+30	+25	+17	+38		
	1917	+43.9	+36.3		+7.94		-38.4	-17.2							+2	+19		-
	1895	-17.5	-44.5	-21.4	-7.9	+27.6	-17.4	-15.4	-27.6	-4.8	-60.3	+41.3	+25.5	+45	74	<b>T13</b>		-
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3	2008			-														
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	1980		-17.6	+ 80	-34.3	-28.4		-60.4		-51.0	-40.1	-63.6	-53.2	-30	-41	-39		
	1952	-50	+34	-37.8	-59.7	-45.3	-45.0			-32.8	+105.9		+7.4	-7	-3	+8		
	1924	-4.8.6	-58.8	-56.6	-36.1	-13.3	-45.2	-16.7						-24	-32	6		
	1896	-34.0	-32.3	-22.8	-18.7	-38.8	-29.3	+0.18	-21.8	-25.3	+08.2	-31.2	-16.5	-24	-32	0		-
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4	2009								-						-			-
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	1987	-31.1					-39.7		+77.2	+9.0	+36.3	+83.0	+477.5	+25	+39	-5		
	1970	?75.9		+41.5		-2.8		-35.7		-20.4	?14.6	+54.8	-10.3	+25	+10	-3		
	1953	-20.3	-26.5	+0.8	-56.1	+4.1	-40.1					-33.2	+12.8	+18	-11	-12		
	1931	+50	-440	+768.	9 +12.3		-24.0		-26.8	+39.2	+14.3					+18		
	1914		0 -13.6	-7.9		-23.1	-19.7		+42.1	-31.3	+67.9	+60.8	+44	+27	+20			
	1897	-34	-42.6	-57.2		-9.47	-48.1	-34.6	+32.1	-26.5	+42.4	+12.8	+ 39.4	-1	+35	-2		
	1875	-34	+11.5		1.11.0	-89.5	-47.4		+50.6	-22.8		+58.1	+25.5	-29	+25	-7		
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5	2010 1993	-37.1	-46.1	-58.6	-17.1	+19.3	-36.9	-27.9		-40.1	-2.40	+9.9	-1.8	-17.5	-12.8			_
5	2010 1993 1971	-37.1 ?7.89	-46.1	-32.3	-61.3	-26.6	-57.4	-19.4	-25.4	-24.6	-14.3	-46.7	+5.1	-29	-35	-10		
5	2010 1993	-37.1	-46.1				-57.4 -4.8	-19.4 -40.2	-25.4 -17.3	-24.6 -26.6	-14.3 ?78.9	-46.7 -52.8	+5.1 ?39.9	-29 +24	-35 -10	-10 +19		
5	2010 1993 1971 1954	-37.1 ?7.89 -27.1	-46.1 -31.3 -54.6	-32.3 -9.4	-61.3 -30.0	-26.6	-57.4	-19.4 -40.2 -43.5	-25.4 -17.3 +63.1	-24.6 -26.6 -31.4	-14.3 ?78.9 +11.3	-46.7 -52.8 +86.7	+5.1 ?39.9 +444.8	-29 +24 8 -18	-35 -10 -11	-10 +19 -28		
5	2010 1993 1971 1954 1937	-37.1 ?7.89 -27.1 -50.8	-46.1 -31.3 -54.6 +15.9	-32.3 -9.4 -89.6	-61.3 -30.0 +10.9	-26.6 +93.4 -9.48	-57.4 -4.8 -35.2	-19.4 -40.2	-25.4 -17.3 +63.1	-24.6 -26.6 -31.4	-14.3 ?78.9 +11.3 -12.6	-46.7 -52.8 +86.7 +58.3	+5.1 ?39.9 +444.8 -14.9	-29 +24 8 -18 +10	-35 -10 -11 +6	-10 +19 -28 +21		
5	2010 1993 1971 1954 1937 1915	-37.1 ?7.89 -27.1 -50.8 +99.4	-46.1 -31.3 -54.6 +15.9 4 -39.0	-32.3 -9.4 -89.6 +18.1	-61.3 -30.0 +10.9 -15.2.	-26.6 +93.4 -9.48 +58.2	-57.4 -4.8 -35.2 -24.4	-19.4 -40.2 -43.5 -8.40	-25.4 -17.3 +63.1 -49.2	-24.6 -26.6 -31.4 +24.4	-14.3 ?78.9 +11.3 -12.6	-46.7 -52.8 +86.7	+5.1 ?39.9 +444.8 -14.9	-29 +24 8 -18	-35 -10 -11	-10 +19 -28		
5	2010 1993 1971 1954 1937 1915 1898	-37.1 77.89 -27.1 -50.8 +99.4 -20	-46.1 -31.3 -54.6 +15.9 + -39.0 -37.2	-32.3 -9.4 -89.6 +18.1 +5.3	-61.3 -30.0 +10.9 -15.2. +47.8	-26.6 +93.4 -9.48 +58.2 -30.2	-57.4 -4.8 -35.2 -24.4 -18.1	-19.4 -40.2 -43.5 -8.40 -34.6	-25.4 -17.3 +63.1 -49.2 -42.1	-24.6 -26.6 -31.4 +24.4 -51.4	-14.3 ?78.9 +11.3 -12.6 +42.4	-46.7 -52.8 +86.7 +58.3 +106.4	+5.1 ?39.9 +444.8 -14.9 -8.5	-29 +24 8 -18 +10 +18	-35 -10 -11 +6 +3	-10 +19 -28 +21 -3		
5	2010 1993 1971 1954 1937 1915	-37.1 ?7.89 -27.1 -50.8 +99.4	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2	-32.3 -9.4 -89.6 +18.1 +5.3	-61.3 -30.0 +10.9 -15.2. +47.8	-26.6 +93.4 -9.48 +58.2	-57.4 -4.8 -35.2 -24.4	-19.4 -40.2 -43.5 -8.40 -34.6	-25.4 -17.3 +63.1 -49.2	-24.6 -26.6 -31.4 +24.4	-14.3 ?78.9 +11.3 -12.6	-46.7 -52.8 +86.7 +58.3	+5.1 ?39.9 +444.8 -14.9	-29 +24 8 -18 +10	-35 -10 -11 +6	-10 +19 -28 +21		
5	2010 1993 1971 1954 1937 1915 1898 1881	-37.1 77.89 -27.1 -50.8 +99.4 -20	-46.1 -31.3 -54.6 +15.9 + -39.0 -37.2	-32.3 -9.4 -89.6 +18.1 +5.3	-61.3 -30.0 +10.9 -15.2. +47.8	-26.6 +93.4 -9.48 +58.2 -30.2	-57.4 -4.8 -35.2 -24.4 -18.1	-19.4 -40.2 -43.5 -8.40 -34.6	-25.4 -17.3 +63.1 -49.2 -42.1	-24.6 -26.6 -31.4 +24.4 -51.4	-14.3 ?78.9 +11.3 -12.6 +42.4	-46.7 -52.8 +86.7 +58.3 +106.4	+5.1 ?39.9 +444.8 -14.9 -8.5	-29 +24 8 -18 +10 +18	-35 -10 -11 +6 +3	-10 +19 -28 +21 -3		
	2010 1993 1971 1954 1937 1915 1898	-37.1 77.89 -27.1 -50.8 +99.4 -20	-46.1 -31.3 -54.6 +15.9 + -39.0 -37.2	-32.3 -9.4 -89.6 +18.1 +5.3	-61.3 -30.0 +10.9 -15.2. +47.8	-26.6 +93.4 -9.48 +58.2 -30.2	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0	-46.7 -52.8 +86.7 +58.3 +106.4 +12	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4	-29 +24 3 -18 +10 +18 -36	-35 -10 -11 +6 +3 +5	-10 +19 -28 +21 -3 +4		
	2010 1993 1971 1954 1937 1915 1898 1881	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9	-46.1 -31.3 -54.6 +15.9 + -39.0 -37.2 +15.0	-32.3 -9.4 -89.6 +18.1 +5.3	-61.3 -30.0 +10.9 -15.2. +47.8	-26.6 +93.4 -9.48 +58.2 -30.2	-57.4 -4.8 -35.2 -24.4 -18.1	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7	-46.7 -52.8 +86.7 +58.3 +106.4 +12	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3	-29 +24 3 -18 +10 +18 -36 -23.5	-35 -10 -11 +6 +3 +5 -34.9	-10 +19 -28 +21 -3 +4 -21.4		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40	-32.3 -9.4 -89.6 +18.1 +5.3 ) +41.2 -55.7	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9.	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2	-46.7 -52.8 +86.7 +58.3 +106.4 +12	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.8	-29 +24 3 -18 +10 +18 -36 -23.5 δ -39	-35 -10 -11 +6 +3 +5 -34.9 -24	-10 +19 -28 +21 -3 +4 -21.4 -21.4 -34		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 +15.0 -40 +39.1	-32.3 -9.4 -89.6 +18.1 +5.3 ) +41.2 -55.7 5 -17.6	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0 -42.6	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -9.7 -49.6	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9.	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7	-46.7 -52.8 +86.7 +58.3 +106.4 +12	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3	-29 +24 3 -18 +10 +18 -36 -23.5	-35 -10 -11 +6 +3 +5 -34.9	-10 +19 -28 +21 -3 +4 -21.4 -21.4 -34 +3		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40 +39.1 -48.3	- 32.3 -9.4 -89.6 +18.1 +5.3 ) +41.2 -55.7 5 -17.6 -37.6	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0 -42.6 -55.5	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -9.7 -49.6 -39.2	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 +75.1 -10.8 -85.1 +94.7	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9. +3.2	-14.3 778.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.6 +1.0	-29 +24 3 -18 +10 +18 -36 -23.5 δ -39	-35 -10 -11 +6 +3 +5 -34.9 -24	-10 +19 -28 +21 -3 +4 -21.4 -21.4 -34		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6	-46.1 -31.3 -54.6 +15.9 -39.0 -37.2 +15.0 -40 +39.1 -48.3 -38.3 -48.3	-32.3 -9.4 -89.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 - -98.9 -67.6 +17.2 -34.1	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9.	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9. +3.2 8?7.7	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2	-29 +24 -18 +10 +18 -36 -23.5 5 -39 +35 +48	-35 -10 -11 +6 +3 +5 -34.9 -24 +20 +58	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -45		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1994 1977 1955 1938 1921	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44.1	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40 +39.1 -48.3 -48.3 -33.3 2 -4.16	-32.3 -9.4 -39.6 +18.1 +5.3 +41.2 -55.7 -17.6 -37.6 +25 -39.8	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0 -42.6 -55.5 215.8 -660	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2	-19.4 -40.2 -43.5 -8.40 -34.6 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8 -47.2	25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 8?7.7 -30.7	-14.3 778.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5	$\begin{array}{r} -29 \\ +24 \\ 3 \\ -18 \\ +10 \\ +18 \\ -36 \\ \hline \\ -23.5 \\ 5 \\ -39 \\ +35 \\ +48 \\ -1 \\ \end{array}$	-35 -10 -11 +6 +3 +5 -34.9 -24 +20 +58 -5	-10 +19 -28 +21 -3 +4 -21.4 -21.4 -34 +3 -45 +13		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44.1	-46.1 -31.3 -54.6 +15.9 -39.0 -37.2 +15.0 -40 +39.1 -48.3 -38.3 -48.3	-32.3 -9.4 -39.6 +18.1 +5.3 +41.2 -55.7 -17.6 -37.6 +25 -39.8	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 - -98.9 -67.6 +17.2 -34.1	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.6 -47.2 -38.1	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7 -37.7	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 87.7 -30.7 -34.1	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9	-29 +24 -18 +10 +18 -36 -23.5 $\hat{o}$ -39 +35 +48 -1 -43	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1899	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 70.93 -49.8 ?95.6 +44.1 -17.2	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40 +39.1 -48.3 733.3 2 -4.16 -85.4	-32.3 -9.4 -39.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8 -660 -74.7	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.6 -47.2 -38.1	25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 87.7 -30.7 -34.1	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5	$\begin{array}{r} -29 \\ +24 \\ 3 \\ -18 \\ +10 \\ +18 \\ -36 \\ \hline \\ -23.5 \\ 5 \\ -39 \\ +35 \\ +48 \\ -1 \\ \end{array}$	-35 -10 -11 +6 +3 +5 -34.9 -24 +20 +58 -5	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32		
	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1994 1977 1955 1938 1921	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 70.93 -49.8 ?95.6 +44.1 -17.2	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40 +39.1 -48.3 -48.3 -33.3 2 -4.16	-32.3 -9.4 -39.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0 -42.6 -55.5 215.8 -660	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.6 -47.2 -38.1	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7 -37.7	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 87.7 -30.7 -34.1	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9	-29 +24 -18 +10 +18 -36 -23.5 $\hat{o}$ -39 +35 +48 -1 -43	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32		
6	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1899 1882	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 70.93 -49.8 ?95.6 +44.1 -17.2	-46.1 -31.3 -54.6 +15.9 4 -39.0 -37.2 +15.0 -40 +39.1 -48.3 733.3 2 -4.16 -85.4	-32.3 -9.4 -39.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8 -660 -74.7	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.6 +25.6 -47.2 -38.1 ?83.3	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7 -37.7 +133.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 8?7.7 -30.7 -30.7 +50.6	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10 +148.0	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 +16	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9 +31.9	-29 +24 3-18 +10 +18 -36 -23.5 5-39 +35 +48 -1 -43 +49	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ \end{array}$ $\begin{array}{r} -34.9 \\ -24 \\ +20 \\ +58 \\ -5 \\ -36 \\ +62 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -3 +4 -21.4 -34 +3 -45 +13 -32 +40		
6	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1899 1882 7 2012	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44. -17.2 +20.	-46.1 -31.3 -54.6 +15.9 +15.9 +39.0 -37.2 +15.0 +39.0 -37.2 +15.0 +39.0 -37.2 +15.0 -40 +39.1 -48.3 ?33.3 2 -4.16 -85.4 1 +165	-32.3 -9.4 -89.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8 +2.4	-61.3 -30.0 +10.9 -15.2. +47.8 2 -56.7 -20.0 -42.6 -55.5 715.8 -660 -74.7 -23.5	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4 +5.41	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4 -32.6	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.6 +25.6 -47.2 -38.1 ?83.3	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3 +13.9 +45.7 -37.7 +133.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 8?7.7 -30.7 -30.7 +50.6	-14.3 ?78.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10 +148.0	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 +16	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9	-29 +24 -18 +10 +18 -36 -23.5 $\hat{o}$ -39 +35 +48 -1 -43	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32		
6	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1889 1882 2012 1984	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44.1 -17.2 +20. -34.6	-46.1 -31.3 -54.6 +15.9 -37.2 +15.0 -40 +39.9 -48.3 733.3 2 -4.16 -85.4 1 +165	-32.3 -9.4 -89.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8 +2.4 -37.4	-61.3 -30.0 +10.9 -15.2 +47.8 -56.7 -20.0 -42.6 -55.5 715.8 -660 -74.7 -23.5 +0.50	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4 +5.41	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4 -32.6 -15.2	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8 -47.2 -38.1 ?83.3 -58.5	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 -10.8 -85.1 +94.7 3+13.9 +45.7 -37.7 +133.1 -84.1	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 87.7 -30.7 -34.1 +50.6 -71.6	-14.3 778.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10 +148.0 +148.0	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 +16 -22	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9 +31.9 -37.8	-29 +24 3-18 +10 +18 -36 -23.5 5-39 +35 +48 -1 -43 +49 -20	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ -34.9 \\ -24 \\ +20 \\ +58 \\ -5 \\ -36 \\ +62 \\ -30 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +4 -21.4 -34 +3 -45 +13 -32 +40 -23		
6	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1889 1882 2012 1984 1956	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44.1 -17.2 +20. -34.6 ?6.87	-46.1 -31.3 -54.6 +15.9 +39.0 -37.2 +15.0 -40 +39.1 -48.3 233.3 2 -4.16 -85.4 1 +165 -56.1 '5 +21.	-32.3 -9.4 -9.4 -89.6 +18.1 +5.3 0 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8 +2.4 -37.4 8 +32.1	-61.3 -30.0 +10.9 -15.2 +47.8 -56.7 -20.0 -42.6 -55.5 715.8 -660 -74.7 -23.5 +0.50 8 70.96	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4 +5.41 +24.4 +49.4 +809	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4 -32.6 -15.2 +37.8	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8 -47.2 -38.1 ?83.3 -58.5 -30.7	-25.4 -17.3 +63.1 +49.2 +42.1 +75.1 +75.1 -10.8 -85.1 +94.7 8+13.9 +45.7 -37.7 +133.1 -38.4	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 8?7.7 -30.7 -34.1 +50.6 -71.6 -14.3	-14.3 778.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10 +148.0 +148.0 +24.6 +503.6	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 +16 -22 +38	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.0 +1.0 ?82.2 +2.5 -22.9 +31.9 -37.8 +19.6	$\begin{array}{r} -29 \\ +24 \\ 3 \\ -18 \\ +10 \\ +18 \\ -36 \\ -36 \\ -23.5 \\ 5 \\ -39 \\ +35 \\ +48 \\ -1 \\ -43 \\ +49 \\ -1 \\ -43 \\ +49 \\ -20 \\ +24 \end{array}$	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ -34.9 \\ -24 \\ +20 \\ +58 \\ -5 \\ -36 \\ +62 \\ -30 \\ +20 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32 +40 -23 +40		
6	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1889 1882 2012 1984 1956 1928	-37.1 77.89 -27.1 -50.8 +99.4 -20 -18.9 -18.9 -29.0 ?0.93 -49.8 ?95.6 +44.1 -17.2 +20.0 +24.6 ?6.87 +37.	-46.1 -31.3 -54.6 +15.9 +15.9 +15.0+	-32.3 -9.4 -89.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -37.6 +25 -39.8 -57.8 +2.4 -37.4 8 +32.3 8 -56.2	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8 -660 -74.7 -23.5 +0.50 8 -70.96 8 -20.96	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4 +5.41 +49.4 +809 -38.5	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4 -32.6 -15.2 +37.8 -20.2	-19.4 -40.2 -43.5 -8.40 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8 -47.2 -38.1 ?83.3 -58.5 -30.7 -27.5	-25.4 -17.3 +63.1 -49.2 -42.1 +75.1 +75.1 -10.8 -85.1 +94.7 3+13.9 +45.7 -37.7 +133.1 -84.1 -38.4 -17.4	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +32.8 8?7.7 -30.7 -34.1 +50.6 -71.6 -14.3 -29.7	-14.3 778.9 +11.3 -12.6 +42.4 +42.4 +41.0 -71.7 9-37.2 +29.2 +89.8 +50.6 -10 +148.0 +148.0 +24.6 +503.6 +102	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 1 +16 	+5.1 ?39.9 +444.8 -14.9 -8.5 +10.4 -49.3 +446.6 +1.0 ?82.2 +2.5 -22.9 +31.9 -37.8 +19.6 +9.5	$\begin{array}{r} -29 \\ +24 \\ 3 -18 \\ +10 \\ +18 \\ -36 \\ -36 \\ -36 \\ -39 \\ +35 \\ +48 \\ -1 \\ -43 \\ +49 \\ -20 \\ +24 \\ +9 \end{array}$	$\begin{array}{c} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -3 +4 -21.4 -34 +3 -45 +13 -32 +40 -23 +40 -2		
15	2010 1993 1971 1954 1937 1915 1898 1881 2011 1994 1977 1955 1938 1921 1889 1882 2012 1984 1956	-37.1 -37.89 -27.1 -50.8 +99.4 -20 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -18.9 -29.0 -20.0 -18.9 -29.0 -18.9 -29.0 -29.0 -18.9 -29.0 -49.8 -29.0 -29.0 -49.8 -29.0 -29.0 -49.8 -29.0 -49.8 -29.0 -49.8 -29.0 -49.8 -44.4 -17.2 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -34.6 -1.0	-46.1 -31.3 -54.6 +15.9 +39.0 -37.2 +15.0 -40 +39.1 -48.3 233.3 2 -4.16 -85.4 1 +165 -56.1 '5 +21.	-32.3 -9.4 -89.6 +18.1 +5.3 +41.2 -55.7 5 -17.6 -37.6 +25 -39.8 -57.8 +2.4 -37.4 8 +32.1 8 -56.2 -47.8	-61.3 -30.0 +10.9 -15.2 +47.8 2 -56.7 -20.0 -42.6 -55.5 ?15.8 -660 -74.7 -23.5 +0.50 8 -70.96 8 -20.96	-26.6 +93.4 -9.48 +58.2 -30.2 -78.3 -98.9 -67.6 +17.2 -34.1 +75.5 -88.4 +5.41 +24.4 +49.4 +809	-57.4 -4.8 -35.2 -24.4 -18.1 -73.3 -9.7 -49.6 -39.2 -36.1 +2 -68.4 -32.6 -15.2 +37.8 -20.2	-19.4 -40.2 -43.5 -8.40 -34.6 -34.6 -34.2 +6.71 -58.4 -16.5 +25.8 -47.2 -38.1 ?83.3 -58.5 -30.7 -27.5 -38.7	-25.4 -17.3 +63.1 +49.2 +42.1 +75.1 +75.1 -10.8 -85.1 +94.7 8+13.9 +45.7 -37.7 +133.1 -38.4	-24.6 -26.6 -31.4 +24.4 -51.4 -123 -37.2 +22.9 +3.2 8?7.7 -30.7 -34.1 +50.6 -71.6 -14.3	-14.3 778.9 +11.3 -12.6 +42.4 +41.0 -71.7 9-37.2 +29.2 +29.2 +50.6 -10 +148.0 +50.6 -10 +148.0 +24.6 +503.6 +102 +102 +90.3	-46.7 -52.8 +86.7 +58.3 +106.4 +12 -71.3 +39.9 +10.6 +81.7 -23.2 +43.5 +16 -22 +38	$\begin{array}{r} +5.1\\ 739.9\\ +444.8\\ -14.9\\ -8.5\\ +10.4\\ \end{array}$	$\begin{array}{r} -29 \\ +24 \\ 3 -18 \\ +10 \\ +18 \\ -36 \\ -36 \\ -39 \\ +35 \\ +48 \\ -1 \\ -43 \\ +49 \\ -20 \\ +24 \\ +9 \end{array}$	$\begin{array}{r} -35 \\ -10 \\ -11 \\ +6 \\ +3 \\ +5 \\ -34.9 \\ -24 \\ +20 \\ +58 \\ -5 \\ -36 \\ +62 \\ -30 \\ +20 \\ \end{array}$	-10 +19 -28 +21 -3 +4 -21.4 -34 +3 -34 +3 -45 +13 -32 +40 -23 +40		

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			June		July			August			SEPTEMBER			OVER	LL SEAS	ON	RÉMARE	S
8	2013	T	R	C	T	R	C	T	R	C	T	R	C	T	R	C		-
	1991	+42.1		+64.5	-11.9	-16.1	-30.2	-39.0	-17.8	-93.7	+1.31	-11.6	+32.7	-9.6	+14.7	+22.6		-
	1974	-26.6	-5.5	-14.3	-46.9	-12.2	-99.9	-22.6	-20.7	-37.2	+17.6	+10.3	+33.6	-24	+19			-
	1957	-16.9	+19.5	+45.3	-49.0	-12.9	-30.4	-1.91	-26.6	+21.3	+12.4	-22.4	-12.1		+8	+24		-
	1935	-6.87	+43.4	-45.1	+11.5	+4.16	-30.6	-31.1	+138.	8+346.3	+51.0	-11.3	-21.8	+2	+35	-24		
	1918	-93.3	-45.9	-16.8	-46.1	-56.3	-62.1	-57.0	-38.2	-40.5	+1.00	+18.1	-13.2	-40	-29	-20		
	1901	-21.0	-6.25	-40.7	-11.5	-69.7	-43.8	-16.3	+10.4	-42.2	-44.0	+30.1	-28.9	-19	-29	-24		+
	1879	-8.51	+18.8	+3.2	-27.8	+48.1	-116.5	+31.4	-10.4	-99.4	+56.7	+19.7	-51	-9	-6	-16		1
9	2014													1				-
	1997	-59.7	+7.9	-65.1	-40.2	-54.2	-37.2	-33.8	-40.7	-48.2	+10.6	+134	+109	-33.2	+14.1	+15		-
	1975	-15.4	-4.9	+53.8	+7.44	+48.3	-16.3	-10.9		-28.5	+149	+31.6	+7.2	+21	+11	+20		-
	1958	-60.6	-19.5	-42.3	-10.1	-16.7	+22.7	-32.0		-15.9	+13.0	-10.4	-12.7	TEI	+8	+10		-
	1941	+18.0	-47.0	+82.5		+578	-70.2	-33.4		269	+37.2	+53.6	+1.2	-32	+8	-5		+
	1919	+26.6	+6.66	-20.1	-41.1	+57.3	-19.7	-55.7		-49.2	+457	+10.7	-26	-32	+2	-15		+
	1902	-36.6	-27.6	-47.8	-48.6	-13.6	-35.5	-12.1		-99.4	+26.3	-13.2	+15.1	-19	-17	+4		
	1885	-20.7	+19.4	-4.2	-14.1	+11.8	-31.5	-47.8		-67.3	+38.5	-25.4	+5.5	-18	-18	-10		1
)	2015																	-
	1998	?1.32	-529	-34.5	-21.5	-58.6	29.8	+15.4	+20.2	151	+49.0	+70.6	+56	-50.9	+37	+25.3		
	1981		-0.6	-26.9	+1.12	-5.9	+10.0	+7.12	-7.6	-28.9	+105.1	+61.2	+24.6	+26	+ 10	+25.3		-
	1959	-4.76	+76.3	+18.3		+9.27	+20.5	-34.2		-30.9	-99.9	+136	-28.8	+20	+10	+12		-
	1942	24.76	+42.7	-12.1	-7.78	-66.7	-47.9	+22.4		-18.4	-44.5	-24.8	+34.2	-4	-20	-20		
	1925		-47.2	+1.0	+2.38	-9.2	-10	-4.93	+19.1		-0.54	-18.4	+386	-4	-20	+4		+-
	1903		-680	+22.6	+54.0	-46.8	+10.2	+34.8	+30.3		+ 5304	+72	+7.0	+45	+39	+4		+
	1886		+3.88	+25.1	+26.6	+69.4	-4.2	+40.6	+40.1		-39.9	+9.04	-99.3	+45	+21	+37		
	2016						116	1 40.0	1 10.1	. 00.0		10.04	35.0	+24	TLI	- 30		
1	1988	-14.2	-57.0	-57.4	+10.7	+77.7	+ 33.6	-25.9	+12.7	+19.4	+136	+33.4	+37.4	+ 65	+50			-
	1966				215.4	+14.3	+ 32.3		+0.5	+6.1	+61.3	+14.8	-27.2	+ 05	+50	+41		
	1932				73.97	-24.1	-13.7			-36.2	+52.6	-20.32	-32.4	+3	-10	+9		-
	1904				-4.6	=22.1	-51.4				+36.9	-39.6	-41.5	-24	-10	-18		1
	1876				-34.7	73.6	-52.1				-40.6	-71.1	-50.4	-24	-53	-30		

## Analysis Of Data Of Bio Forecast

Date of Experiment	Number of Biolumicells	Actual Weather
1-May-1991	8	
2-May-1991	14	
3-May-1991	19	
4-May-1991	20	
5-May-1991	28	
6-May-1991	22	
7-May-1991	50	
8-May-1991	65	
9-May-1991	83	
10-May-1991	89	
11-May-1991	72	
12-May-1991	40	
13-May-1991	30	
14-May-1991	14	
15-May-1991	11	
16-May-1991	6	
17-May-1991	12	
18-May-1991	3	
19-May-1991	10	
20-May-1991	8	
21-May-1991	16	
22-May-1991	9	
23-May-1991	12	
24-May-1991	5	
25-May-1991	6	Low
26-May-1991	10	Low
27-May-1991	19	Depression
28-May-1991	8	Cyclone
29-May-1991	3	Cyclone
30-May-1991	11	Depression
31-May-1991	9	Depression



-150 **APCOST** Phone: 38587 Grams : APCOST ANDHRA PRADESH STATE COUNCIL OF SCIENCE & TECHNOLOGY (CONSTITUTED BY GOVT. OF A. P.) 10-2-289/16, 1st MAIN ROAD, SANTINAGAR, HYDERABAD-500 028 PROCEEDINGS OF THE MEMBER-SECRETARY, A.P. STATE COUNCIL OF SCIENCE & TECHNOLOGY: HYDERABAD. PRESENT: SRI G.VEERACHANDRA RAO. Proc. No. ADMN/RESEARCH/231/91. Dated: 25-06-91. Sub: - APCOST - Minutes of Evaluation Committee on 9-4-91. Ref:- Application of Sri 1. Gangadhara Rao, Date: 7-5-91 . -:::-ORDER: In persuance of the decision taken in the meeting of the Member-Secretary, APCOST, held with the Director, SRAC and the Director, A.P.Science Centre on 9-4-91 in his Chember an amount of Rs.150/- per month is sanctioned towards assist to Sri. I.Gangadhar Rao to supply daily data of his work on measurement of Circular Rind Structures reflected on the Mi for Ball to further explore the inter-connection of Earths Geo-Magne-tic field with Natural **Struct**amities and their effect on human impulse. This assistance will be paid for April. May & Jupe 1991 impulse. This assistance will be paid for April, May & June 1991. Sd/- G.VEERACHANDRA RAO. MEMBERI- SECRETARY. //t.c.f.b.o// ADMINISTE OFFIC Copy to individual . Accounts wing for N.a. Copy to File. \*BNR\*

9/1/2016