

# OUR IMMEDIATE POLITICAL OUTLOOK

LECTURE DELIVERED

BY

Dr. T. M. NAIR

*On 14th March 1917*



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LECTURE BY DR. T. M. NAIR.

Dr. T. M. Nair delivered his lecture on "Our Immediate Political Outlook" before a crowded gathering in the Victoria Public Hall on Wednesday the 14th March 1917 under the auspices of the Muthialpet Muslim Anjuman. There were many prominent people present on the occasion and several gentlemen from the mofussil had come specially to attend the meeting. Those present at the meeting included Raja Ramarayaningar, the Hon'ble Mr. T. Ranga Chariar, Kumarajah of Chellepalli, Dewan Bahadur P. Kesava Pillai, Khan Bahadur Buddrudin Sahib, Rao Bahadur P. Theagaraya Chetty, Rao Sahib C. Ramanujam Chetty, Moulvi Fazlulla Sahib, Dr. Zainulabdin, Dr. Muhamad Oosman, Messrs. P. N. Raman Pillai, T. Abdul Wahab Saib, P. N. Marthandam Pillai, K. Govinda Marar, P. Chidambaram Pillai, Prof. J. B. Raju, Messrs. T. Ethiraja Mudaliar, P. V. Doraiswami Mudaliar, Rao Bahadur G. Narayanaswami Chetty, Messrs.

Malay Ahmad Badsha Sahib, M. D. Devadoss, Dr. S. Jesudoss, Messrs. B. Hussain Sahib, C. T. Alwar Chetty, M. Appaswami Pillai, Haji C. Hussain Saib, Haji Mahamad Sahib, P. M. Kassim Mahamad Marakayar of Mandapam, M. O. Shaik Farid Marakayar, V. S. Bava Sahib Marakayar, M. K. Mira Sahib Marakayar, S. T. O. Muhamad Marakayar, S. M. Hamid Sultan, N. M. Malim Sahib, Dr. M. Ghouse and Dr. U. Rama Rao.

A remarkable feature of the meeting was that in spite of its being one of the most crowded meetings held in the Hall it was also one of the most orderly held in the hall in recent days. From the very commencement of the lecture to the end of it, which took over an hour to deliver, the audience kept perfect silence and listened with rapt attention to every word of the speaker.

The Hon'ble Khan Bahadur Ahmed Thambi Marickayar was voted to the chair.

Dr. Oosman announced that he had received letters regretting inability to attend from the following gentlemen: Sultan Ali Raja of Cannanore, Hon'ble Mr. Chidambaranatha Mudaliar, Khan Sahib Muhamad Razak Marakayar of Cuddalore, Khan Sahib Haji Abdul Kayar of Porto Novo, T. S. M. Marakayar of Nagore, T. M. Muhamad Yousuf Sahib of Trichinopoly.

The Secretary also announced the receipt of



the following resolution passed in anticipation of this lecture, at the public meeting of the Mohamedans of Vaniambady held under the auspices of the Anjuman-i-Khire Khahaiaam, Vaniambady, on last Saturday with Khan Bahadur Haji Badruddin Sahib, President of the Anjuman, in the chair, namely "That the demand for Home Rule at present is premature seeing that there are not sufficient men in all the communities fit to command the confidence of both the Government and the people."

**The Hon'ble Khan Bahadur Ahmed  
Thambi Marickayar.**

The Chairman then addressed the meeting as follows:—

Gentlemen—Allow me to express my gratitude to my brother members of the Muthialpet Muslim Anjuman, for the honour they have done me in asking me to preside at this meeting, convened under the auspices of the Anjuman, for the purpose of listening to a lecture by one of the ablest and best informed public men of the Presidency on a subject of very great importance, viz., "OUR IMMEDIATE POLITICAL OUTLOOK". I have had the pleasure of serving in the Madras Legislative Council along with Dr. Nair, and I can bear witness to the strong influence he exerted on the judgment of his colleagues, both on the Government and on the non-official side. His

speeches were so full of facts, his logic so incisive, his style so simple and clear, that whenever he intervened in a debate, those with whom he agreed felt an accession of strength and those who differed from him felt that they were put on their defence. I have had no opportunity of acquainting myself with what Dr. Nair is going to say this evening. But, judging from the title of the lecture, I presume that his thoughts run in the same direction as mine. Like most Mohamedans, I am a practical man concerned with the immediate business on hand, and not given to indulging in dreams, which do not take into account the stubborn facts of life. I know what Home Rule would mean to my community at the present moment, for Home Rule does not depend merely on the capacity of any man or any community. True Home Rule should be based upon the relations of one man to another and of one community to another. You all know, gentlemen, how diversified and divided the people of India are, and, but for the British Government, how much more diversified and divided they would be. If there is now a movement towards unity among them, thanks are due to the presence of the British Government in India; and our political evolution depends upon strengthening that Government in such a way that, through its influence, we may learn to behave justly and

sympathetically towards one another both as individuals and as communities, and thus create the unity without which Home Rule would mean wresting power from the hands of the British, and setting up an oligarchy in the land.

Besides unity, we want also a rise in the level of popular intelligence. This can be secured by education. By education I do not mean the mere passing of examinations. I know many persons who have passed examinations and still entertain narrow prejudice, the same as the women at home who are kept in ignorance. Education, widespread education, education at home, in society, in business, in public life,—education among the rich and the poor, education among Hindus, Mohammedans, Christians, Parsees, etc., education all along the line is what is wanted before we are qualified to talk of Home Rule as a pressing problem of the present day politics. Let us, in our day and generation, strive for that unity and enlightenment, which we can get only through the British Government, and that will pave the way for real Self-Government. Let Hindus and Mohammedans become the guardians of each other's interests. Till this consummation is reached, we require the Britisher to hold the balance even between different communities and equalise the opportunities open to them. Let the different communities also come forward to take advantage



of the educational facilities provided for them by our benign Government. Speaking for my community, I feel we have got to make headway educationally a great deal more than we have done in the past. What Mohamedans should aim at, first and foremost, is the training of their young men in such a way that they may be able to fill high and responsible places in public service in the various professions, in the field of commerce and industries, in public bodies and in public life generally. To say Home Rule first and education next, is to put the cart before the horse. Education first, and then all other things will follow.

Instances are not wanting to show that our lot will be from bad to worse if Self-Government were given to us at this stage. We have got Self-Government in miniature in local bodies, such as the Municipalities and the District and Taluk Boards, and let us consider how far Mohamedan population is represented in these bodies. It was only the other day that I had the opportunity of getting at the statistics, which will throw a flood of light on the question whether our Mussalman brethren will find a proper place in bigger assemblies if the so-much-talked-of Self-Government were a reality. Out of 801 members in the 25 District Boards, our Mohamedan community is represented only by 72, of whom only 24 are returned by election. In fact, 11 District Boards



including South Canara and South Arcot, which contain a large proportion of Mussalman population, are without even a single Mohamedan elected representative. Let us go to the Taluk Boards, and find out whether a better state of things exists there. Alas! we find only 97 Mussalman members (of whom only 23 were returned by election) in all the Taluk Boards of the Presidency, consisting of 1,241 members, and as many as 76 Taluk Boards are devoid of a single elected Mohamedan representative. Even in Municipalities, our community cannot be proud of having their proportionate representation, for we do not find more than 130 Mohamedan Councillors in all the 68 Municipalities, which carry 1,121 Councillors on the whole and even out of the 130 Councillors, only 46 have had the benefit of being elected. To sum up the above figures, we find the total number of members in the local bodies is 3,163, of which 299 only are our representatives. Of this only 93 are returned by election. Had it not been for the good grace of the Government in nominating 206 Mussalmans, our share in the administration of local bodies will be highly deplorable. These figures are sufficient, I believe, to convince anyone who is interested in the welfare of the community that the members of our community are not at present enabled, perhaps by their own lack of education to take as much

part in the political affairs of our country, as their numbers and the traditions of the community would justify. I leave it to judge for yourself, therefore, what part we would play in the administration of the country, if Self-Government were given us.

It might not be out of place here in this assembly to invite the attention of my Mussalman brethren to a long-standing grievance of our community, viz., the want of a Mussalman Organ to shape Mussalman public opinion and bring prominently to light the needs of the community. It is no use for us, Mohamedans at least, to cry for the moon now, but, on the other hand, we should first set ourselves to work to see that our community rises up to the level of the sister communities of India, and in order to attain that stage, it is absolutely necessary for us to have a Mussalman daily advocating Mussalman interest, working for Mussalman advancement, and pleading the cause of the Mussalman community. This is one of the aims which I have had in view for a long time, and I have been consulting several of our leaders who are as anxious as myself in this matter, and I hope that my fellow Mussalmans will co-operate with the movement and make it a success.

To return to the subject proper, I wish to repeat that our community, which is far below

the level of the sister communities which are numerically superior, will dwindle into insignificance and will be deprived of any share in the administration of the country if Self-Government were given us at this stage.

When there is sufficient fellow-feeling among the various communities as the result of each community being able to inspire respect in other communities, then it will be time to think of Self-Government, in any large sense of the word. Then and not till then.

Gentlemen, most of you will be very anxious to hear Dr. Nair, and, therefore, I do not propose to trespass on your patience any longer. With these observations, therefore, I have much pleasure in requesting Dr. Nair to deliver his lecture on "Our Immediate Political Outlook," and I have not the slightest doubt that you will give him a patient hearing and that his lecture will be very interesting, instructive and inspiring.

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### DR. T. M. NAIR'S SPEECH

Dr. Nair who was received with loud cheers then addressed the meeting.

MR. CHAIRMAN AND GENTLEMEN,—My first duty on this occasion is to apologise to you for the disappointment which I caused on the 29th of January last. I would have left it at that, had it



not been for the fact that a few days after my recovery from illness a very respectable Mohamedan gentleman came to me and asked me whether I was really ill on the 29th. This led me to make a little investigation as to why he asked me that question, and I found out that I have been accused of malingering in order to escape appearing on this platform on the 29th January. And as for the reason why I malingered, there were several versions given out. I may not have heard all the reasons yet. Some I did. The first reason was that I was afraid of Pandit Madan Mohan Malaviya who was speaking in this hall the next day. Gentlemen, I know Pandit Madan Mohan Malaviya. At least I used to know him in olden days. I have been amused at him, but it never entered my mind to be afraid of him. If I had no reason to be afraid of him then I have still less reason to be afraid of him now. I dare say that the Pandit would have blamed me for the so-called sectarian movement with which I was connected, but I did not know that Pandit Malaviya could find fault with sectarian movements. If he did so it would be very much like Satan rebuking sin. As the leader of the biggest sectarian movement in India he could not very well have attacked me; at all events I see no reason to be afraid of that. Then I was told that the rumour was current that



the Government had stopped me. That is an extraordinary thing because there is no reason why Government should stop my meeting. I am not a German agent (Laughter). I never received money from any German. I have tipped many a German waiter in London in the old days. Then my money passed into German hands. So Government had no reason whatever to stop my meeting. Well, I won't try to follow the other reasons given, but I may assure you that I would have been here, willing to discharge my duty on the 29th if I had not been in a helpless condition and two doctors asked me not to get up from my bed at all. Gentlemen, these and many other things make me feel to-night standing here exactly like a man who has won an obstacle race. You know the feeling when you have won an obstacle race. I never knew before that it was such a difficult thing to get a meeting and address an audience. It never was so in olden times. My friends used to come and say there was such and such an obstacle in the way of your meeting. I use to say then 'drop the meeting.' My friends were persistent till at last I am here. But my Chairman here to night, I think, has also met with obstacles. I am told that he escaped being elected as Chairman of the Negapatam Municipality because in an unfortunate moment he consented

to preside at my meeting. Gentlemen, I am very sorry for that. I don't mind facing misfortunes myself but I don't like the idea of bringing misfortune on my friends and I hope that Mr. Ahmed Thamby Markayar will bear up with that and survive. I myself have survived. I have been told that hundreds of cocoanuts have been broken in temples in order that I may not recover from my illness. (Laughter) I don't mind that. I heard sometime ago that in my native district of Malabar they could not get a market for cocoanuts. If in this way they can find a small market in Madras I am glad I have been of some service to my native district.

Well, Gentlemen, now that you are met here let us have our say. The subject is "Our Immediate Political Outlook." If you want to discuss the question of our immediate political outlook, you must study a little of your immediate past. What has been our political condition in the past? Perhaps some of you young men might not have followed very closely the course of politics in the past. But a good many of you will remember that our political condition in the past was this: that we people of India were always asking for the advancement of our political condition and the British Government listening to our demands used periodically to give us political concessions. This country came directly under

the British Crown in 1858. So far as the Government of India is concerned, from 1861 onwards there have been a series of Acts governing the Government of India which culminated in the Legislation of 1909. Also, very soon after this country passed directly under the British Crown, they also introduced a system of Local Self-Government in India which also they have been periodically revising and improving at each revision. Therefore our past condition was this. We were demanding political concessions and the Government from time to time were granting us political concessions. I don't for a moment say that the concessions have always been all that we asked for. It can never be in any country. The people will always ask for a little more than the Government are willing to give. But once it is assured that you will go on steadily progressing and your political condition is on the onward march, always improving, never receding, it is a source of satisfaction. Till very recently we were all satisfied with that state of affairs. I remember that the concession granted in 1909, commonly known as Minto-Morley Reforms, were hailed with delight in this country. I was myself present in this hall at a meeting where Lords Minto and Morley were thanked for this reform. Several of my political colleagues in Madras were present and they also addressed that meeting. Of course



a good many said it was not all that they wanted. Well, I was one of those who said so myself, but we all accepted it as an instalment, and made up our minds to wait for the next instalment, to continuously ask for more, and receive what was given at the next instalment. But within the last two years a very sudden change has come in the political condition of India, and before we proceed further we must analyse and get to the bottom of this new political movement and find out the causes that brought it about, the circumstances that justify it, and its chances of success? You must analyse this and get a satisfactory reply before you come to the subject proper. Because, if you can show that the latest political movement, rather a violent one in my opinion, has the ghost of a chance of being accepted by the British public then that is our immediate political outlook. I am here to prove to you that it has not got the ghost of a chance, and therefore you must think of something else as your immediate political outlook. Gentlemen, I am perfectly familiar with the cry of Home Rule because my student days in Great Britain coincided with the time when the most acute controversy was going on regarding the Home Rule movement in Ireland. For five or six years I was in the arena of politics where we heard nothing but Home Rule. Everywhere it was Home Rule. In any



political meeting, whatever other subjects were discussed, Home Rule for Ireland was invariably there. I am therefore perfectly familiar with a cry of Home Rule as it existed in England. But when I heard the same cry in India, I could not in the beginning realise that it was an earnest cry, because nobody who knew the conditions under which Home Rule could be granted, the conditions under which there was a chance of its being granted, would ever have thought of raising a cry for Home Rule in India. The conditions even in Ireland were not ideal for Home Rule, but then you must remember that the Irish agitation was only for the re-establishment of a Parliament which they had for a long time. The Irish had a Parliament of their own and it was the Act of Union in 1800 that took away that Parliament and ever since the Act of Union the Irish public have never been quiet. In some form or other they have been agitating for the repeal of the Act of Union. It is true that in the earlier part of the century, it did not actually take the form of Home Rule Movement. They formally constituted the Home Rule Movement only in the latter part of the 19th century. Their agitation for Catholic emancipation and various other cries were practically cries for Home Rule which in their case meant the return of the Parliament that had been taken away from them. In the case of

India the question is far different. We have never had a Parliament here and I do not know whether we have ever had Self-Government in the proper sense of the term. I know it is a fashion now a days to go back to the ancient Hindu Kings and to describe all the wonderful things that we had and compare them to the miserable state of things in this 20th century, and we are sometimes told that Self-Government in a most perfect form existed in ancient India and therefore we are now asking for what we had. As far as I can make out, the only Self-Government they had in ancient India was a system of village Panchayats, Panchayats for isolated villages. A federation of these village Panchayats in its large sense never took place, because there was no proper communication between village and village in those days, and each village was self-contained. Nothing higher than that in the way of Self-Government I have seen mentioned anywhere in any authoritative works recorded as having existed in ancient India. Now, for arguments sake let me concede for one moment that you had Self-Government in ancient India. Your ancestors are so far removed from you at the present day that you have nothing to show of any inherited capacity for Self-Government. If you had any inherited capacity for Self-Government from your distant ancestors your Municipalities

would have been better managed. It would never have taken such a long time for you to get in the way of managing even small Municipalities. Therefore I disregard that argument altogether. In India for all practical purposes, if we must have Self-Government, we must be trained for it. We must acquire the capacity, develop our qualities in that respect and then start on Self-Government. In the second place Home Rule can only be given to a country where there is only one nation, absolutely united, with no sectional differences. That lesson you are learning now from Irish Home Rule. With all things that favoured the granting of Home Rule to a nation who once had their own Parliament, with all the advantages, they are still far from having Home Rule. Why? Because there are certain counties which are inhabited by Protestants and the rest of Ireland are Catholics. Mind you, Gentlemen, on that one point of difference, Ireland has not got Home Rule and from all that you can see from the discussion in the House of Commons on Home Rule, I do not think Ireland will get Home Rule in the sense of Catholic Ireland being able to rule over Protestant Ulster. So, that is another condition which is absolutely essential for Home Rule which does not exist here. The third condition for Home Rule is that the people of the country must be sufficiently advanced in education and



intelligence to exercise their franchise intelligently. Now we know that an overwhelming majority of the people of this country are not so advanced, and therefore nobody who understood the conditions necessary for granting Home Rule would seriously have proposed Home Rule for India. Then it was still more surprising that the first move in this direction was made by an English lady, I do not know whether she is English or Irish, but she has had considerable experience of English political life in her younger days, and is thoroughly conversant with political matters and therefore could not possibly have put forward a proposal of Home Rule for India in a state of ignorance. We have on paper a record of what her opinions were on the question of India demanding Self-Government. I will only trouble you with one or two extracts. In a speech which she delivered in 1905 she said :—"Geography has a determining influence on nationality. No two nations can exist in the same soil. A nation must have a national territory and we cannot have a Hindu nation and a Musalman nation in India. We must have one Indian nation from the Himalayas to the Cape Camorin, from Bengal to Kathiawar. No such nation has ever existed in India. India has always been and still is a mere geographical expression." No sane man or woman for that matter would propose to grant



Home Rule to a geographical expression (Applause.) Now passing from 1905 and coming to 1911 the lady says again, "English Rule is just ; let the Indian citizen first learn to stand and walk before he asks to Rule and Govern." No truer words were ever spoken. Gentlemen, it has a bearing on the granting of Self-Government to our country. And as late as 1911 this lady held exceedingly correct views of what are the conditions precedent to granting Home Rule. In 1915, only four years after she delivered the last quotation which I have read out to you, she comes out as leader of the Home Rule Movement. I have taken some trouble to follow closely the conditions under which this Home Rule Movement has developed. Here we are in a country with a large number of politicians with a political organisation called the Indian National Congress to which all the leading men in the country are attached. How did it come about that this lady in such a short time snatched the political initiative from the hands of the Congress, spread a propaganda of her own, captured a good many in the Congress and now began to lead them instead of following them ? How did it come about ? The evolution of the Home Rule idea in Madras is unfolded in the pages of "New India." And if any one will take the trouble of going back and reading the articles connected with this movement, it will

repay the industry. The Home Rule Movement first originated with the attempt to bring about the Congress compromise. You remember that at Surat in 1907, after a pugilistic encounter between various sections of the delegates the Congress split up into two sections which I believe were called extremists and moderates. I believe these were the terms used. And the attempt of 1914 was really to bring about a re-union between extremists and moderates, at all events so it appears to be on the surface. Then this attempt failed, and on the rejection of the compromise proposal we find in "New India" a threat that if the Congress still remained in a condition of masterly inactivity, then it will be well for younger people to take action, not in opposition to the Congress which must always be regarded as the head of political activities in India but as supplementing its work in a field which it does not wish to occupy at present. In other words. "If the Congress will not take up Home Rule I shall." That was practically the meaning of it. Then came a series of articles in "New India" on the resurrection of Asia, and it claimed that India should be given Home Rule as a sort of defensive measure against the advance of China. If China becomes a great nation she may attack India, and India, in order to defend herself, ought to be given Home Rule and made to stand on her own legs. That was

the argument put forward. Then there was a distinct warning in the "New India" of the 3rd August 1915 that the people should agitate for Self-Government and should fight for Freedom and exclaimed "Who will join hands with us" That is the call for recruits. Then came an article on the 17th of August in which she argued that in the reconstruction of the Empire lay the opportunity of India for Freedom. The genesis of the thing was the declaration of war, and the whole thing originated several months after England had declared war against Germany and was likely to be pre-occupied in several directions ; and here is the distinct statement that the opportunity for India is the reconstruction of the Empire which will follow the war. But whoever said that there will be a reconstruction of the Empire. Whoever said that any remodification of Indian conditions would ever be made I have never seen any responsible man say that. Then on the 7th September "New India" announced that Mrs. Besant had gone to Bombay to see Sir Pherozeshah Mehta with a view to consulting him regarding the political situation in India. In other words to sound Sir Pherozesha Mehta as to the Home Rule propaganda. That is what I infer. On September 13th a representative of the Associated Press of Bombay had a talk with her on Indian Self-Government. She



said that the country must be stirred in the matter and that the Congress should lead in the matter and, if the Congress did not, she should take up the question herself. She continued to say that after the Congress had formulated a scheme for Self-Government which she called Home Rule for India, the English people being more familiar with Home Rule, and perhaps "more opposed too", the country would be stirred on that behalf. Then on the 15th of September Mrs. Besant wrote on Congress and Self-Government and wanted Sir S. P. Sinha to claim Swaraj. She attacked Sir Pherozeshah Mehta, evidently the interview was not satisfactory, and said that he had so long dominated Bombay that it was doubtful if any one else had the courage to lead as well and could be depended upon. A sick man could not be vigorous nor inclined to sketch a vigorous policy for his followers. Bombay had given no sign of preparing the way for Home Rule. Then on September 25th the Home Rule League was born in Madras. Mr. Dadhabhoy Naoroji was said to be the President, but he promptly contradicted it and since then the Home Rule Movement had gone on. In 1915 the attempt was made to capture the Congress for the Home Rule Movement. Thanks to the firmness and sagacity of Sir S. P. Sinha than whom a more level-headed politician we had not in India, that attempt failed. It was

postponed to the following Congress. I have no authoritative version of what took place in the following Congress and therefore I shall not venture to speak upon it. It is for the Congress politicians to say as distinctly and emphatically as they can whether they are for Home Rule as sketched by Mrs. Besant or whether they are not. I had tried to ascertain from one or two of my friends but failed. They said Home Rule and Self-Government are just the same but slightly different and so on ; but I could not get anything definite from them ; therefore, it is for them to say whether they are Home Rulers or not. For us here it is quite sufficient to say that we are entirely against the movement started by Mrs. Besant for Home Rule (Applause) because we are not ready for it. I do not for one moment say that the time will not come when we shall have Home Rule. That time will come (Applause). Neither Mrs. Besant nor Mr. Ahmed Thamby Maracayar nor I will live to see it because it will be long long after our time. There are so many conditions that you have to comply with before you can get it. If we get it before complying with those conditions it will be ruinous to the country. Ireland was about to get Home Rule just before the War. The Home Rule Bill was going through the Houses. It passed through the House of Commons. It was rejected twice by the House of Lords and a third time

if rejected they could declare that the bill was passed. What happened? Civil war was threatened. Many of the military men quartered in Ireland declined to fire on their countrymen. Therefore the military was of no use. Ireland was on the brink of a civil war. When this war broke out an amicable arrangement was arrived at to temporarily put the Home Rule Bill on the Statute Book and not to bring it in operation till the Houses had another chance of discussing it. Therefore if you get Home Rule now which is not feasible to-day, not essential to-day and not indispensable to-day, it will bring no final settlement with it. In a divided country like this, with several sections, under Home Rule you will get considerably less than what you will get under a Government like that of Great Britain which has established and holds sway all over India. Gentlemen, there is one small subject I want to deal with before I proceed further. In this connection they have calculated that there will be reconstruction in the Empire and that in that reconstruction India will also be included. It is the usual faith of the socialist that if the existing arrangements are upset, in the resulting changes instead of being at the bottom he may find himself on the top, and therefore a good many people hanker for change ; but a change from an established condition must



be very gradual and very slow. You must consider each step in it ; otherwise after the change you will find yourselves in a considerably worse position than you were in the beginning. There is to be reconstruction in England. There may be reconstruction in many of the colonies, because you have got very good reasons for it. What do you find in England at the present time as the result of the War ? Most of the factories have been shut down or are given over to the Government for the manufacturing of munitions. Therefore their industries are in a paralysed state. The men are all taken to the military, the machinery are all taken for the manufacturing of munitions ; their production from an economic point of view is stopped and so their industries are paralysed. At the beginning of the war England had a standing army of about 750,000 men. At present they have five million men in the field in Flanders, and these men were raised by conscription, which means they have been asked to give up their private occupations and go and join the army and fight. Five million men and more people have been taken away from ordinary occupation and after two or three years when they come back they will have to be put on their legs again. Now that means enormous work. We have not got either of these conditions in India. Condition No. 3,

Their financial expenditure before the war is over will come to such a large sum that the annual expenditure for loan charges will come to £300,000,000. It is roughly calculated that £300,000,000 will go to the sinking fund and loan charges on the money that they have raised for this war. The Normal Revenue is about £100,000,000. They will have to raise three hundred million pounds extra annually to meet the loan charges. Where is this to be raised? That is exactly the reason why they will have to bring the colonies to bear the financial burden. No one will bear the burden unless you have privileges corresponding to that. We have not been asked to bear that burden. We will not be able to bear that burden. (A voice: We are giving a hundred millions.) A good many of the colonies have given a great deal more. It is only the annual charge that is £300,000,000. Therefore they will want reconstruction from that point of view. Then<sup>e</sup> they have found a good many defects exposed by the war, a good many defects in their system of education, in their organisation and other things disclosed by the war. They will have to correct them, which means an enormous reconstruction. Then they have to consolidate the alliances already formed. There are so many nations who have formed alliances, fighting with them. These are the men who help them in

adversity. A friend in need is a friend indeed. If they are to continue their alliances, they will have to make some arrangements regarding tariffs and other things. India is not affected by any of these, and therefore why should we say that necessarily there will be a reconstruction for India as well? I decline to believe that we shall be affected by the reconstruction connected with the war, but that does not prevent us from asking for the next instalment of political reform. It does not by any means prevent us from asking for any political reform. Well, in asking for political reform there are one or two things to be borne in mind. One is that a reform merely based on sentimental grounds and has no practical application is no good. You must ask for something which is practical, which anybody can put in practice. If you simply say on sentimental grounds you want such and such things, no value will be attached by any practical politician to it and when your demand is taken to England and analysed, the politicians there will say, these are the people who say they are fit for Self-Government. But people who make demands like this are not practical men. That is the danger which you must always apprehend. In putting forward your demands try and see that they are practical, Now leaving the subject of Home Rule, I come to



the only practical proposals that I have heard for our next instalment of political reforms. You have heard of the memorandum of the nineteen members of the Imperial Legislative Council which has been submitted to the Viceroy. I have been abused, attacked, rebuked for having ventured to express dissent from this document. I have now to justify my dissent. I dissent from this document because in my opinion it is an impracticable and unworkable scheme. If you will permit me a few minutes I will take proposal by proposal. The first proposal is with regard to the Executive Council. They asked that the Executive Council of the Viceroy and of the Provincial Governors should contain a large proportion of Indians. That certainly is a reasonable proposal. They say that there ought to be at least half the number of Executive Councillors who are Indians and I believe the idea is that the number of the Executive Councillors of the Provincial Governors should be raised to six, three Indians and three Europeans. That is a sound proposal and nobody will find fault with it. If they had stopped there it would have been a practical suggestion, but they do not stop here. They say that elected representatives of the people should have a voice in the selection of the Executive Council. Now that proposal will at once strike a practical politician as

an impracticable one. The Governor in Council constituted the Government of this country. Let us take Madras for example, Lord Pentland is the head of the Government of Madras. He has got three Councillors assisting him, but, for the work of the three Councillors and for any action of the Government of Madras the man who is responsible is Lord Pentland. It is Lord Pentland's Government ; and it is customary all over the world, where such a system of Government exists, that the head of the Government is to be permitted to choose his colleagues. It is so in every civilized country except one. I will come to that. In every civilized country it is the practice because if he does not choose his colleagues you cannot hold him responsible for their actions. Lord Pentland might say any day you elected my colleagues ; I cannot get on with them ; I am not responsible for their work. If he says so, what is your reply ? There is no reply. And no man with self-respect would consent to be the Head of a Government where his colleagues are thrust upon him by somebody else. And if he has not got the power to select his own colleagues and construct the Government with his own chosen colleagues no respectable man will take it up. It is an absolutely impracticable proposal. Then I told you there is one exception to this rule and this is Switzerland. The executive of the Federal

Council in Switzerland is elected by the Federal Council. But Switzerland is a unique country. Those of you who have studied the Swiss Constitution cannot help being struck with the unique idea of a people governing themselves directly.

The executive commission of the Swiss Federal Government is known as the Swiss Federal Council. It consists of seven members elected for a term of 3 years by the two Houses of the Federal Legislature acting together in Joint Session as a Federal Assembly. The Federal Assembly may elect to the Council any Swiss Citizen who is eligible to either Chamber. If a member of the Legislature is elected to a place on the Executive Body it necessitates his resignation of the Legislative function ; members of the Executive are not members of the Legislative Bodies. They may attend and take part in the Debates but they may not vote. *The Members of the Swiss Executive are the Servants of the Legislative Houses not their leaders.*

The Swiss Federal Council Executive would be very much like the Municipal Commissioner under the new constitution of the Madras Corporation, not even so good. This gentleman at least has certain good powers of his own. These people have no power whatever except to obey what the people say. In any other country where Parliamentary Government goes on, the system of elec-



tion would be impracticable and unworkable. I don't know why on earth a difference in that practice is asked for here. I asked a friend of mine why they put forward such an absurd proposal. It vitiated the whole of the memorandum. He said Government sometimes put in useless men, and it was to prevent that. What are you doing in the council? Looking at a dummy, grinning at him? If you do your duty, no Government will dare bring in a dummy. They have to face questions in council. Ask a dummy a few questions and he would run away for all he is worth. If the non-official Council Members do their duty properly no dummy will be able to face them. The fact of the matter is non-official members want to vote themselves into the Executive Councils. Well, Gentlemen, if that proposal goes it does not require a very great politician to find out that the men who drafted the memorandum know nothing of practical politics. These minor defects are nothing compared to the defect that comes next. They say that all the Legislative Councils in India should have a substantial majority of elected representatives. Read that in conjunction with the other condition that the Budget should be passed in the shape of money bills, fiscal autonomy being conceded to India. Take the two conditions. There ought to be a majority of elected members

in the Madras Legislative Council. The Budget ought to be passed through this Council, in the shape of money bills. A bill has several stages to go through a Council. For a resolution there is only one division, sometimes they will have a snatch division. But a bill has got an obstacle race to go through, and all the financial proposals must go in the shape of money bills. Every one who knows practical politics knows that unless a bill has got a majority at its back it can never get through the house. It cannot be got through by accident. Unless a majority of the members of a particular council are in favour of a particular bill that bill can never get through that Council. Assuming that a majority of these elected men are bent upon economy, or some of them are determined to stand against the Government how will the Budget ever get through. The Budget may be defeated at any stage. Any bills can be smashed at any stage. The Government cannot get a Budget through. If you do not get the Budget through, you cannot get a pie of taxation. Supposing such a contingency occurs what would happen under the proposal is, I can tell you what would happen in other places. In the English House of Commons the Chancellor of the Exchequer introduces the Budget, and if any item was vetoed the Government resigns as a body, and another body comes in and forms a

Government. Any defeat on the Budget is <sup>a</sup> necessary condition for the resignation of the Ministry. That is what happens in England, France and other countries. In Switzerland where there is an Executive who, as I told you, are practically the servants of the Council, the Council will do what the Parliament likes. Lord Pentland proposes a Budget ; if it is not accepted he cannot carry on the administration. You cannot expect him to resign because resignation of the Ministry is only practical where there is another body to form a Ministry. You cannot expect Lord Pentland to resign and go away. You cannot take charge of the Government. You are not asking for that. You are not advanced so far. You can ask for that if you have put the proposal in a different way —, that the Governor or Viceroy does not enter the Ministry at all, but sits on high and watches. The Executive Government is constituted from among the leading men here and he asks one man to form a Ministry. Such a Ministry if defeated can resign and the Governor can call another man to form a Ministry. This is Colonial Self-Government. Those gentlemen who drafted this memorandum were asking for Home Rule. They made a slight alteration so far as the Viceroy was concerned, at the same time the other conditions they did not alter. Therefore we have got a mongrel which will never work. I should like any of these nineteen



members or their admirers to put forward a method by which you can get over this difficulty of Government and enable them to carry on the administration with a power to put the Budget through the Council. I see that these gentlemen who drafted the memorandum are carried away in their enthusiasm for the great capacity of the Indian for administration. They say that our short experience in this direction has shown that there are Indians like Sir S. P. Sinha, Sir Ali Imam, Mr. V. Krishnaswamy Iyer, Sir Shamsul Huda and Sir Sankaran Nair who have maintained a high level of administrative ability in the discharge of their duties. They have, I see omitted to mention the name of Sir Sivaswamy Iyer, Mr. Chaubal and Sir Prabhasankar Pattani particularly Sir Sivaswamy Iyer because he is the second Indian Member who has retired after completing his term as Executive Councillor, Sir Ali Imam being the first. Others have all occupied a short space of time or have only begun their career. Besides, this gentleman has made discoveries in administrative fields. He discovered that the addition of non-officials to the Sanitary Board would only add to its numerical strength. He might have made a similar discovery about the Executive Council itself. Therefore it is rather cruel to have omitted him. Moreover they say it is well-known that the Native States have produced renowned adminis-

trators like Sir Salar Sung, Sir T. Madhava Rao, Sir Seshadri Iyer, Dewan Bahadur Raghunatha Rao, not to mention the present administrators of the various Native States. I am here emphatically to say that we don't want the system and methods of administration in the Native States to be brought into British India. (Hear, Hear.) Whatever your disadvantages under British Government, the greatest enjoyment that you have under the British Government is the enjoyment of personal freedom. That is exactly what you have not in the Native States. Included in the signatories of this memorandum is one gentleman who could tell you how he was treated in a Native State when he went there to deliver a series of lectures. Evidently that is why he demands that sort of Native States Government. Perhaps if the British Government will treat him in the same manner he would begin to admire the British Government. Gentlemen, whenever any one comes and tells you that the system of Government in some other places is better than here, don't believe it. I have been a bit of a traveller in my life-time, and I have been in many countries and seen the conditions in those countries. I have never come across a country where there is so much freedom as in the British Empire. I have lived in Germany, France and Italy, all advanced European countries, but would you believe it that a German in Germany,

a Frenchman in France, or an Italian in Italy enjoys less personal freedom than you people enjoy here. There is an old story told as to how people are treated in Berlin. In cafes, something like D'Anglies where you go and take refreshment, there are detectives overhearing the conversation of any one seated there. On one occasion there were two new Englishmen there. All at once one of them raised his voice a little and said "I think that the Emperor is a bally fool." The moment he said it, the detective came up and arrested him. "Why do you arrest me?" he asked. He was told he had abused the Emperor. "I was not talking about your Emperor at all. We are talking about the Russian Emperor." "There is only one Emperor in the world that answers your description and that is the German Emperor" said the detective. Now, Gentlemen, there is one more subject here and I think I had better conclude with that.

The President of the last Congress, Mr. Ambika Charan Mazumdar, a very old friend of mine, said in his speech that it is not necessary that the masses of the people should be educated at all before we can have Self-Government. They would have a class of educated men at the top. They will carry on the Government and see to the interest of the people of this country and look after the interest of the masses as well.



as any foreigner. That is a statement which requires some consideration, because all demand for Self-Government at present is based on that. Everybody has to admit that the great mass of the people of the country have not sufficient education to understand the franchise. Therefore the granting of Self-Government simply would mean that you must leave the masses to be taken care of by the better classes of the people. There are dangers in it. Wherever this state of affairs has taken place, it was found in course of time that the upper classes who were ready to receive Self-Government crushed those below them and kept power in their own hands and stuck to it with a tenacity which was surprising. And when the people themselves became ready to take their share in the Government of the country the people who held power as trustees declined to part with it. England is the only country where this transfer of the power from the aristocracy went on in a peaceful way. I mean by peaceful, without bloodshed. They have had political fights but without bloodshed. England is the only country where the transfer of power took place peacefully. In France you had the Revolution, but the best example of the latter is Germany. In Germany to-day true democracy is not established. Power in Germany is in the hands of a small oligarchy. They control the

Emperor and they control everything else. It is an oligarchy that has brought the world into this ruinous war. And German democracy in order to come to their own will have to ask the help of the Allies after the war. This task of handing the power into the hands of one community in trust in order that later on when the others are ready they may take it back, is beset with considerable difficulty. Wherever you can go on without this temporary handing over, go without it. In European countries it was inevitable because they had to go on somehow. Here it is not inevitable. Till the masses can be educated and brought up to a condition in which they can exercise the functions of Self-Government we have very good persons to take care of them. What need is there to transfer from these trustees to other trustees powers which will have later on to be transferred again. I do not think that any Indian will dispute that the British Government have proved admirable trustees and representatives of the interests of the people. (Applause.) If you say that the educated men in this country will be as good guardians of the uneducated, I have only to take a few instances and point out to you what has been done. I am speaking to members of a Mohamedan association. I may point out to you what has been done in connection with the Public Service Commis-

sion in your name and interest. The evidence of a large number of educated people in this country before the Public Service Commission was in favour of what has been for a very long time called the Simultaneous Examination. That is an examination for the Indian Civil Service to be held in England and at the same time in India for which candidates can appear either here or there and those who pass in it will be tabulated in one list, but a large number of people found fault with it. They did not want it because they said by this system of examination a particular class only will get admission, and admission into the Government service is important for this one aspect,—It has got political powers and unless political power is equally distributed there is always danger. That has been the experience of countries where there are mixed populations. If you concentrate power in the hands of one community there is always the danger of the other communities being tyrannised, and the other communities rising in rebellion against the tyranny and oppression of the powerful class. But here are the two opinions and when the Public Service Commission came here you had a Mohamedan representative on that to watch your interest and after the Public Services Commission had gone all over India and had sent in their report, the Mohamedan representative is the only man who



pleads for simultaneous examinations, all the others going against it. And curiously enough I saw his defender in the Press in Madras saying that he has gone on evidence. Such an impartial man, that he has gone on evidence ! The other people had not gone on evidence ! This gentleman alone had gone on evidence, and yet what are the facts ? I see in the voluminous report of the Public Service Commission evidence that 28 Mohamedan gentlemen gave evidence before the Commission out of whom 7 are for Simultaneous Examinations, 15 against, 4 for Simultaneous Examination but not open competition, stating that those who pass in the examination ought to be picked up according to communal conditions, which is practically against Simultaneous Examinations. One gentleman said ' My personal opinion is for Simultaneous Examination, but I am here as the representative of my community and my community is against it.' A very frank and honest statement. One gentleman of the Provincial Service gave no opinion on the subject. Now, the majority of the Public Service Commission has pointed out the difficulty also with regard to Provinces. In certain Provinces feelings against certain things are stronger than in others. Therefore it is interesting to notice how this Mohamedan opinion is divided. In Bengal 3 men gave evidence, one was against Simultaneous Examina-

tion and the other was half and half for communal representation and the other gave no evidence on this point. In Punjab 5 were against Simultaneous Examinations and one for communal representation. So you see that the opinion of Punjab goes against Simultaneous Examination. In the United Provinces of Agra and Oudh 3 were against and one for Simultaneous Examination and 2 for communal selection. Here again a strong preponderance of opinions is against Simultaneous Examination. In Behar and Orissa 2 for and against ; in Central Provinces 2 Mohamedans gave evidence and both were against. In Bombay 3 for, one against, in Burma only one witness for Simultaneous Examination. Here is the voice of the Mohamedan community by an overwhelming majority saying that they are against open competition. They want communal selection ; yet the educated Mohamedan representative on the Commission says exactly the opposite. Therefore can you leave the interests of your community in the hands of your leaders ? I think the time has not come simply to trust the educated man and say ' Let him decide for us.' My own opinion is that in most of these cases we have received impartial treatment more from Europeans than from men of our own communities (Applause).

Now gentlemen, I have kept you a very long time. The next subject I want to deal with is something connected with practical reforms. I am afraid that I have passed the time and as it is past half past six, I will postpone that subject. I will deal with it some where soon and tell you what my views are. You can criticise it or reject it or do whatever you like. One word before I conclude. There has been a great deal of speculation as to the formation of an Imperial Parliament and what India's position in that Parliament will be. There has been no such authoritative pronouncement on the part of any leading politician. As to the formation of an Imperial Parliament which will look after Imperial affairs and the Local Parliament which will look after local affairs nothing has been decided. Some of the colonies are against the proposal. Some are in favour and finally they may find that the majority of the colonies are against the proposals involved in it and they may not proceed with the thing at all. But let us take for argument's sake that such a proposal does come within practical politics and that the component parts, except India, should come to constitute Parliament sitting in London for the management of the imperial affairs. It is highly improbable that this Imperial Parliament will directly deal with India. India may not get



what is called Home Rule, but India may have autonomy in the sense that the Government of India will take the place of the Parliament in the Colonies if they have to constitute an Imperial Parliament. I do not expect they will give you Home Rule. But it is exceedingly likely that the rigid control now exercised over the Government of India will be relaxed. For all practical purpose India would be a self-governing country, not self-governing in the sense that India will be governed by Indians, but governed by the Government of India as it is at present constituted, perhaps a little modified. Under these conditions the question of representation of Indians in the Imperial Parliament will only be for imperial purposes. There will be no necessity for sending your representatives to that Parliament in order to look after your internal affairs and then I may assure you that India will have representation in some form in such a Parliament as that. If it is two houses it will have representation in both the houses. But I do not think any sane Indian will claim that India should be represented proportionately, that is in proportion to her population. Because if you are represented by population you will swamp the rest of the British Empire. But representation, for having your side of the case represented, there will be. The proportion may be small, but you will have the dignity of being

represented in the Imperial Parliament for all practical purposes. The difficulties that some of us were contemplating was, if this Parliament should take on its shoulders the administration and supervision of India it stands to reason that, if it has divested itself of all the local affairs, the constitution of the Parliament will be such that it will not be fit to look after internal affairs of India. Further evolution there must be, and even if there is no such evolution, if other proposals are brought forward, then it will be time to get excited. Hysterical politics and political hysteria are meaningless. I have attempted to point out what our immediate political outlook is. The outlook is to pursue the same path we were pursuing hitherto. Go on in the same path trusting in the Government which has till now given you concessions, not because they were afraid of you—they have no reason to be afraid of you,—but because they considered them to be just. They are delaying concessions, they are giving them in instalments because you must have time to learn. As yet your public men have learned very little. You have only very few public men who have learned them at all. You must have better capacity developed on the part of your public men and more such public men. It may be that you have not been given opportunities. Your Legislative Council, it

is said, as it exists now does no good. I do not share that view. Lord Morley's reforms gave us the reformed Legislative Council. I said to a friend of mine when the reforms were announced "Look at its constitution. I think it is only intended to be a platform for public men. It is intended for public men in India to learn work of that kind and to get accustomed to it." Unless you have a large number of men like them, where are the men for future parliaments? A new member who comes to the council will be inconvenienced for sometime till he has learned the work. Therefore you must ask for hundreds of members. If you ask for a large increase of members of Legislative Council perhaps it will be granted and then ask for special representation for all the communities and let hundreds and hundreds of your men go into these councils, learn the work and the method of carrying on public administration. When you have got sufficient number of men then ask for a constitution. Now, you do not know what to do. Half your municipalities are mismanaged. They do not understand the principle of municipal administration. You want men who really understand it. Therefore do really work in the way of improving yourself and then the reforms you ask for will come in unasked.

Dr. Muhamad Oosman then proposed a vote



of thanks to the Chairman for presiding on the occasion. The Chairman and Dr. Nair were then garlanded after which the gathering dispersed.

**A LECTURE**  
ON  
**Indian Chronology and the Precession of  
Equinoxes.**

**By Dewan Bahadur,  
L. D. Swamikannu Pillai, M.A., LL.B.,**

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At the fourth day's sitting of the sixth Annual session of the South Indian Association held at the Ranade Library, Mylapore, on 1st April 1911, Dewan Bahadur L. D. Swamikannu Pillai, M.A., LL.B., presented to the Association a copy of his "Indian Chronology" and at the same time delivered a lecture on some aspects of Indian astronomy, its equal claims with Western astronomy as a basis of chronology and its remarkable freedom from error. Mr Swamikannu Pillai said :—

So long as the Indian system of chronology was the only one in force in India, its efficiency was, naturally enough, beyond question. It is true that there were a large number of Siddhantas, many of them being recensions of older works, of which the second Arya Siddhanta and the second Surya Siddhanta are conspicuous instances ; but the differences among these Siddhantas were differences, not so much in system or principle, but in details of calculation, such as there might be between one modern astronomer of repute and another. Gradually, all the Siddhantas except one, the Surya Siddhanta, ceased to lay claim to uni

versal recognition, and we have a long period of nearly 700 or 800 years, during which the Surya Siddhanta reigned supreme. Many must have been the occasions when the adherents of the Surya Siddhanta must have heard of, if not personally seen, their European confrères who practised a different system of astronomy. Nevertheless, they adhered, in the main, to the old system and received with great caution such foreign doctrines as the precession of equinoxes. The great European Sanskritists of the 18th century, notably Jones and Colebrooke, while they made careful notes of the differences between European and Indian astronomy, refrained, with equal care, from making any suggestion that Indians should deviate from the accepted principles of Indian astronomy. It was reserved for Indians themselves within the last fifty years, when they had studied the principles of European astronomy and had had opportunity to note the enormous superiority of its methods and results, to express dissatisfaction with their old system, which till then they had well-nigh worshipped as sacred and inviolable. Many of them clamoured for the Tropical system, although they were aware of the numerous changes imported into that system owing to the discovery of past errors. Others, less clamorous for so drastic a change, nevertheless wished to abandon most of the rules inculcated by the Indian system and devised a middle plan or compromise known as Drigganita. From the point of view of astrology in particular, it was contended that the old methods were unsatisfactory and their results inaccurate, some Indian astrologers having gone so far as to press into their service the new European planets of Uranus and Neptune.



How far these attacks from within on the ancient citadel of astronomy will be seconded by the common people it is impossible to forecast at present. Much will depend on the attitude taken by the educated classes and in order that they may judge aright, it is essential that they should try to understand the issues involved.

If I have rendered any small service to Indian astrology, it is this that, as it were, I have levelled the field for fair play. I have in the first place endeavoured, in the book which I am presenting to the Association to-day, to take the educated Indian reader over the familiar ground of tithis and nakshatras, as determined in the panchangams daily and hourly handled by him. It was impossible, to take him over the ground as left by divers schools of panchangams, each ploughing his own particular groove year after year, and making the furrows deeper and deeper. Just as astronomers first consider the course of a mean sun before considering his anomalies, I had to lay down first of all a mean or standard calculation, following to the best of my ability one standard system, the Surya Siddhanta. Even here it was impossible to lay down the traditional method of arriving at Surya Siddhanta results—to have done that would have been to scare away the student of our modern schools, to have enhanced in fact his dread of the Indian system, for he is apt to confound its principles with its methods. It is a legitimate interference with ancient systems to exhibit their results through the medium of modern methods. Where the Indian system said that the sun performed a certain number of revolutions in a yuga of 24,30000 years I have merely stated that the period of

revolution of the sun according to the Surya Siddhanta is 365.258756184 days, which is absolutely the same result. Where the Indian system said that the vara or week day should be ascertained by dividing the total number of days elapsed since the year 0 of Kaliyuga by seven, I have substituted the simpler method of ascertaining the week day by means of my perpetual almanac (Table IV). By taking these liberties with ancient methods,—they are no liberties at all so long as ancient results are still faithfully presented,—it was possible to show to the educated Indian reader that the results predicted in his panchangam are results which even a child may deduce from known first principles of Indian astronomy.

Thorough knowledge of and familiarity with the ground being secured in this way, we may now indulge in some discussion of controversial questions. The first friendly contest we shall engage in on our re-formed ground shall turn on the question of the hour: the origin of the Indian celestial sphere. And here you will permit me to explain that what astronomers mean by the "origin of the celestial sphere" is different from what we should ordinarily understand by that expression. We are apt to suppose that the question is historical, and no doubt there is a much debated historical question, whether the Hindus obtained their first rudiments of astronomical science from sources now known to us, to wit, the Greek and Arab Schools of astronomy, or whether the origin of the science of Indian astronomy is lost in the nebula of primitive Vedic civilization and history. That is not the question we shall discuss to-night. If I may vary the phrase a little, I propose to consider with you

tonight the merits of the Indian astronomical system as a basis of chronology, and to help us in considering its merits, I shall make some mention of that other much mooted question, the zero point of longitude of the Indian Ecliptic. We shall endeavour as far as possible not to get lost in phrases, astronomical or any other, but to get hold of palpable, tangible facts.

The best way of doing this, it seems to me, is the comparative method. We may compare our own system with any other with which we are fairly familiar. In the next place, astronomy is a very large field, and we shall pursue the comparative method, selecting for the objects of comparison only a small portion of that field, namely, Indian chronology and European chronology, each alike the offspring of a particular astronomical method.

We may deal with European chronology or calendar in a few words. As re-constituted by Julius Cæsar, the calendar year was made tropical and it was made to consist of 365·25 days. That is to say, it was ordered by Julius Cæsar that the interval between two successive vernal equinoxes should be regarded as 365·25 days. What is the vernal equinox? If any of you will look at the starry sky with the help of a star-atlas, or what is much better, with the help of a practical astronomer, of whom there are several among my hearers, you will notice a belt of stars forming the equator and another belt composed of the 12 signs of the Zodiac which make up the Ecliptic. Now, one of the two points where these two belts meet or cross each other is called the vernal equinox or the First point of Aries of European astronomy.



The state of knowledge at the time of Julius Cæsar regarding the vernal equinox may be inferred from what is now known regarding the discoveries of Hipparchus, the father of modern astronomy, who flourished between B. C. 160 and B. C. 125. Now the facts observed by Hipparchus sufficed, as demonstrated by the French astronomer Delambre at the beginning of the the last century, for arriving at very nearly the modern estimate of the rate of precession; but he himself fixed the length of the tropical year at  $365\frac{1}{4}$  days, although he pointed out that this fixation involved an error of 1 day in 300 years. This in brief was the system adopted by Julius Cæsar in his reformed calendar, viz, that the year should be reckoned at a mean length of  $365\frac{1}{4}$  days, for which purpose he introduced the well-known rule as to bissextile or leap years. The Julian Calendar did not concern itself with the error of 1 day in 300 years, pointed out by Hipparchus. Europe was content to observe this calendar for nearly 1600 years, although it was a patent fact that the equinoxes, instead of falling on the same day of the year as they ought to have done, that is on the 25th March, which was the Equinox of the Julian Calendar, were coming earlier and earlier in the year. Thus at the Council of Nice, the equinox fell on the 21st March, and in 1582 it fell on the 11th March. Pope Gregory XIII, who filled the papal throne in the latter year, decided, after consultation with astronomers, to reform the Julian Calendar and this he did (1) by dropping 10 days in the year 1582, so as to restore the Equinox to the Nicene date, 21st March (2) by dropping 3 leap years out of every 100 for all future time. The second reform was necessary, because by assuming the length

of the mean tropical year as  $365\frac{1}{4}$  days, the error is really 1 day in every 128 years and not merely 1 day in 300 years, as supposed by Hipparchus. We have not quite done with reforms of the European calendar, because long ere we shall arrive at the year 4000 A.D. we shall have reckoned a day too much and it is proposed by calendar reformers, anticipating the needs of a very remote posterity, that the year 4000 A. D. and all multiples of that figure shall be ordinary years. The calendar, as reformed by Pope Gregory XIII was adopted in the United Kingdom by an Act of the British Parliament in the year 1752.

Now this is one side of the the picture. Let us look at the history of the Indian year during the same period. Here we have a calendar system which the earliest records brought to light by epigraphical researches prove to have been maintained in its present form since the 5th century A. D. Equinoxes have been as carefully observed in India as in Europe; in fact for many processes in Indian astronomy, *e.g.* the determination of the lagna, of local sunrise and local sunset, it is necessary to take into account the tropical longitude of the distance of the sun from the 1st point of Aries in the European sense. The rule laid down on this subject by Bhaskara in the Goladhyaya of his Siddhanta Siromani (first half of 12th century), is that the year 528 A.D. should be regarded as the year when the tropical and the sidereal longitude coincided and that for every subsequent year  $59\cdot9007''$  should be added to the sidereal in order to arrive at the tropical longitude.

Let us see how far Bhaskara's rule will help us to discover the Sun's true tropical longitude or, which is

the same thing, the true vernal equinox in the year 1900 A.D.

The interval between 528 A.D. and 1900 A. D. is 1372 years and the corresponding correction for tropical longitude according to Bhaskara, is  $1372 \times 59.9007$   
 $= 22.0^{\circ} 49' 43.76''$   
 $= 22.828822^{\circ}$

Now let us take for comparison a particular "epoch," as it is called, for which we have a recorded mean tropical longitude of the sun, as calculated by a modern European astronomer of repute. We have such a calculation by Newcomb for Greenwich mean noon A.D. 1900, Jan. 0.0, by which astronomers mean the mean noon of 31st December 1899.

Now by Table VIII in "Indian Chronology" the 31st Decr. is the 275th day from 1st April. As the Indian Solar year 1899 began (by the Surya Siddhanta) on April 12.3617, we have the following calculations for ascertaining the Sun's Indian longitude, at the epoch we are considering.

January 0.0, 1900 in Lanka time = 31st Decr. 1899  
 $= 275\text{th day from 1st April 1899 (Table VIII).}$

Deduct 12.3617 days commencement of  
 Indian Solar year A.D.  
 1899).

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262.6383 days from commencement  
 of Indian solar year.

add .25 Interval from Lanka  
 sunrise to Lanka noon.

add .2105 for time difference bet-



ween Lanka noon and  
Greenwich noon.

---

263.0983 days

By Table XVII A.  $257.074056^{\circ}$  = sun's longitude (side-  
real) of 263 days com-  
plete.

By Table XVII C.  $.09737728^{\circ}$  = increase of Sun's  
longitude for .0988  
day.

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Total  $257.171433^{\circ}$  =  $257^{\circ} 10' 17.16''$

Newcomb's tropical longitude of the Sun for the  
same moment is  $279^{\circ} 41' 48.04''$

=  $279.69667^{\circ}$

Deduct  $257.171433$  Indian longitude of  
Sun for the same  
moment.

---

Difference  $22.52524^{\circ}$

This is the actual difference between the tropical  
and sidereal longitude of the Sun according  
to European and Indian Astronomy.

According to Bhaskara's rule the difference ought  
to be, as we saw above,  $22.8288^{\circ}$

In other words, by following Bhaskara's rule,  
there will be a slight error of  $.3036^{\circ}$  or  $18' 36''$  in the  
sun's longitude after 800 years.

We might similarly calculate the difference bet-  
ween Surya Siddhanta results and those of European  
Astronomy as regards mean tithis, which so far as  
European Astronomy is concerned, are recorded in the  
Encyclopædia Britannica, 7th Edn., for the mean new

moon in March of every year from the year A. D. 1800 to A. D. 1900, the same mean new moons, according to the Surya Siddhanta, are shown in table X of "Indian Chronology." The comparison shows that we have to add 45 palas or 18 minutes to mean time i.e. reduce by 9 or 10 minutes of a degree the moon's mean elongation according to Surya Siddhanta in order to arrive at the moon's elongation according to European astronomy for the year A. D. 1900.

The result of our investigation is that by following Surya Siddhanta results as propounded by Bhaskara we advance Sun's tropical longitude by  $18\frac{1}{2}$  minutes for 800 years and in the same period we exaggerate the moon's mean elongation by a quantity between 9 and 10 minutes of a degree.

If we had a person now exercising the same authority to correct the Indian chronology that Pope Gregory XIII exercised in 1582 to correct European chronology, he would, instead of directing us to drop 10 days of the calendar, as Pope-Gregory XIII did, merely oblige us to drop  $18\frac{1}{2}$  minutes of the sun's mean tropical longitude and 10 minutes from the moon's mean elongation.

I do not disguise the fact that our anomaly tables are different from the European anomaly tables : but it is the error in mean places that permanently affects any system of astronomical chronology, seeing that errors in anomalies and equations are adjusted from time to time, at short intervals.

Regarding the correction of the Indian Calendar, you are all aware that Sri Sankarachariar, the venerable head of Sringeri Mutt, with whom I had, thanks to

the good offices of the Hon'ble Mr. T. V. Seshagiri Aiyar, the honour of an interview on this very subject in Sept. last, has, during the past few years, devoted a good deal of time, attention and money to the task of possible reform. I have shown that if any reform is at all needed, it is very slight, so slight indeed that nobody would think it worthwhile to barter away our system for the European system in order to save the nation the trouble of making a very slight emendation.

If this is all the magnitude, rather if this is the microscopic irregularity of our calendar system (truly it is a case for applying a microscope rather than a telescope to correct our natural vision) what becomes, you will ask me, of the serious charges that have been laid at the door of the Indian system? I quite admit that our tithis occasionally go wrong to the extent of 10 to 17 ghatikas, owing to our anomaly tables being inadequate, but I do maintain that an anomaly table is a quite secondary concern in a reform of the calendar. In fact Pope-Gregory XIII never troubled himself about the anomalies, although the object of his reform was to rectify the date of the new moon whereby Easter is fixed every year. Anomaly tables can be altered without changing the essential characteristics of any chronology. I have, in my Manual of Indian Chronology, drawn up tentatively a set of anomaly tables whereby you can get the tithis correct within 2 ghatikas of the Nautical Almanac, and all the while without deviating, except to the extent of 9 or 10 minutes of a degree, from the Surya Siddhanta mean places for the Sun and the Moon. With a very little elaboration, these anomaly tables can be altered so as to give absolutely correct Nautical Almanac results, and



you can apply such tables to any period of history or chronology. For instance, you could apply them to Rama's horoscope, B. C. 961 (according to Bentley) and then you would get, thanks to the Surya Siddhanta mean places, a result as accurate to the second as the Nautical Almanac would have made it out, had such an almanac existed in B. C. 961. Of course, if your object was to verify a date in chronology, you would merely apply the anomalistic tables which were used by the chronologer whose date you were verifying. You could in this way apply half a dozen anomalistic tables to the same mean places, and all the while you would not change the essential character of your chronology. Here again, there is no need to barter away our system for the sake of a little trouble in devising or applying a fresh set of anomalistic tables. I do not think that any one who appeared at Sri Sankarachariar's astronomical conferences cared to analyse our Indian results or to differentiate the essential correctness of our mean results from the accidental results of each almanac maker using a particular set of anomalistic tables.

From the point of view of an apologist for the Indian system of luni-solar chronology, I might have concluded my lecture here, having convinced you, as I hope I have done, that our system of chronology does not present any error worth mentioning, even after ~~1500~~ years of use ; but the subject of precession of equinoxes which I have hitherto held in the background, is too important for us not to attempt to get behind the veil or try to understand for ourselves the issues involved.

If we wish to study practically the effect on the visible heavens of the precession of equinoxes, we cannot hope to do so in a day or a year or even in a hundred years ; but if we had access to astronomical records, however imperfect, which had been collected by observers for a thousand years, or what would be much better, the records of their observation for two thousand years, the effect would in a sense be very palpable.

Let us now place ourselves under the open sky on a cloudless night, watching the stars that set immediately before sun-rise or immediately after sun set. If we do this with a star-atlas for a couple of months or so, we shall become familiar with the constellations of the zodiac and be able to place ourselves in the position of our ancestors who similarly watched them without telescopes and nautical almanacs to guide them. We shall notice that the signs of the zodiac are distributed about the celestial equator or the belt of the sky running from due east to due west, but that the constellations pass north and south of the belt, meeting it at only two points which are respectively the vernal and autumnal equinox. Also at the same time of the year, the same constellations are found to rise or set with the sun. We must try and get a clear notion of the expression "the same time of the year" by which we mean the same seasons, whether we call them "spring, summer, autumn and winter" or "hot, rainy, and cold weather." Now it is a fact within the experience of all ancient civilised peoples that after about 500 years or so, or still more palpably after about 2,000 years, the starry seasons change, that is, the same stars rising or setting with the sun do not bring the same seasons round and what must have

been to them still more surprising, the equinoxes and solstices occur before their time. By solstices we mean the parts of the year when the sun begins to turn from the north to the south (which is properly, the Daskshinayana or summer solstice) or from the south to the north (which is properly, the Uttarayana or winter solstice). The solstices as well as the equinoxes play an important part in primitive chronology since they are easily perceived phenomena. Hipparchus, as I have already stated, noticed the gradual anticipation of the solstices and conjectured the real reason of the phenomenon, which, under the name of the *precession of equinoxes* has been accurately investigated in modern times.

Its general character may be studied by setting the rim of a glass tumbler revolving (in imitation of the earth) round the rim of another somewhat larger tumbler which we will call the ecliptic. The bottom of each tumbler should be turned outward, that is, the tumblers should be, not one inside the other, but in contact at their rims. You can easily imagine each tumbler to be conical and to end in a point instead of in a flat bottom or what is called in mathematics in the frustum of a cone; the pointed end of each tumbler would be a pole, the end of the tumbler at rest being the pole of the ecliptic and the end of the revolving tumbler the pole of the equator. You should next rotate the revolving tumbler very gradually, so as to touch in succession every point of the rim of the tumbler at rest, until you have carried the revolving tumbler once round the circumference of the tumbler at rest. You will then see that as the equator of the earth, in the course of several



thousand yearly revolutions touches successively every point of the ecliptic, its poles also perform a revolution similar to that of a top nodding before it "goes to sleep." The object of the experiment is to impress on you this peculiar and interesting motion of the earth's pole, or which is the same thing, of the celestial pole. The period of each of these revolutions, that is, of the pole as well as of the equinoxes, is 25,868 years. [Curiously enough, these figures coincide with the first five decimal places in the length of Arya Siddhanta solar year (365·252680555 days), but there is no mathematical reason that can account for the coincidence]. You see that a complete revolution of the equinoxes takes a very long time, the annual motion of the precession being only  $50'2''$ . As a consequence of this revolution, however, not only do the starry seasons change every two thousand years or so, but there is a corresponding change in the polar star, the same star not continuing for more than the above period to fulfil the function of a Pole or North star. Lastly, you should remember that the motion of the equinoxes is from east to west, whereas the apparent motion of the sun among the stars is from west to east. The tendency of the precession is, therefore, to shorten the length of the sidereal year.

Now the Indian year is sidereal, that is, it is reckoned from the time when the sun leaves a certain position among the stars till the time next year when he returns again to that position, whereas the European year is *tropical*, that is, it is reckoned from vernal equinox to vernal equinox. The practical result of this difference between the two systems is that the Indian sidereal year begins every year later and later

with reference to the tropical year. In B.C. 1 it began on the 15th March and this year A.D. 1911 it will begin on the 13th April. The interval in days between the dates of commencement of the two years is a good index of the precession. The difference is at present about 23 days, whereas the present precessional difference in degrees between European and Indian Astronomy is  $22\frac{1}{2}^{\circ}$ . The following is a direct and ready method of investigating the difference. We first of all set down the lengths of the different kinds of years, European and Indian.

—	Days.	Hrs.	Min.	Secs.	The same in decimals of a day.
(1) European anomalous year ...	365	6	13	48.09	365.2596296
(2) Indian solar (sidereal) year ...	365	6	12	36.56	365.258756
(3) European sidereal year ...	365	6	9	8.97	365.256354
(4) European Tropical year ...	365	5	48	45.51	365.2422408

We at once perceive an important difference between the European and the Indian sidereal year. While the European sidereal year continues or runs on for  $20\frac{1}{2}$  minutes (of time) beyond the tropical year the Indian sidereal year continues to run for  $39\frac{20}{60}$  minutes (of time) beyond the European sidereal year and  $23\frac{5}{6}$  minutes of time beyond the tropical year. Reducing these minutes of time to minutes of space or of longitude, we have :—Difference between European sidereal and Tropical Longitude  $50.2''$  Difference between European sidereal and Indian sidereal Longitude  $8.5''$  *per annum*.

Difference between Indian sidereal and European tropical longitude  $58.7''$  *per annum*.

It will be instructive to study the actual directions of the several forward and backward movements of the different years.

If we imagine the zero point of sidereal longitude *proper* to be absolutely stationary, as no doubt it ought to be and is, among the stars, we shall perceive that both the zero point of *European* tropical longitude and the zero point of the *Indian* solar longitude are on the move relatively to the zero point of *proper* sidereal longitude, the former with a comparatively quick motion of  $50.2''$  per annum and the latter with a comparatively slow motion of  $8.5''$  per annum. Altogether the vernal equinox or the zero point European tropical longitude recedes from the zero point of Indian solar longitude at the rate of  $58.735''$  per annum, while the zero point of the *proper* sidereal longitude is receding in the same direction from the zero point of Indian solar longitude, but at the rate of  $8.5''$  of a degree per annum. If now we ascertain, as we did before, the actual difference between the longitude of the sun at any moment according to European and according to Indian Astronomy, we have the following instructive problem as well as its solution.

For the epoch we examined in the first part of this lecture, namely, Greenwich mean noon, 31st December 1899, we found the difference between Indian solar and European tropical longitude to be  $22.52524$  degrees.

We know that out of every  $58.73''$  of difference between Indian and Tropical solar longitude, (this is the annual difference)  $8.5''$  is what we may call



the sidereal error of Indian Astronomy. Out of  $22.52^{\circ}$ , the sidereal error is, by rule of three,  $3.26715^{\circ}$ .

Again since  $8.5''$  is the Indian sidereal error for 1 year,  $3.26715^{\circ}$  is, by rule of three, the error for 1380 years.

Now counting 1380 years back from A.D. 1900 we arrive at A.D. 520. That is to say, the year when the European sidereal longitude actually coincided with the Indian sidereal longitude must have been A.D. 520, and it must also have been the year when the Indian sidereal coincided with the European Tropical longitudes. In other words A.D. 520 *was the year when all these longitudes were zero at the same moment*. Now according to the present *Surya Siddhanta* the sidereal coincided with the Tropical signs in A.D. 499 (K.Y. 3600, expired). By almost all the other authorities the coincidence took place in A.D. 522 (K. Y. 3623, expired) and by the *Siddhanta Siromani* in A.D. 527 (K.Y. 3628, expired)—*Sewell and Dikshil's Indian Calendar*, page 10. Our conclusion, arrived at from a calculated datum of European Astronomy and a calculated datum of Indian Astronomy, agrees exactly with the historical datum furnished by the Indian writers themselves. Whitney, in his translation of the *Surya Siddhanta*, arrives at the year A.D. 560 as the year of coincidence, but there is no real reason to distrust the statement of Astronomers of the time that the coincidence took Indian place in or very near A.D. 520. Next, as regards the yearly amount of precession, we have this following startling agreement between our conclusions, based on present day Astronomy, Indian and

European, and the statement of Bhaskaracharya in the *Goladhyaya* of his *Siddhanta Siromani* (written about A.D. 1140). "The intersection of the ecliptic and equinoctial circles is the *Krantipata* intersecting point of the sun's path. Its revolutions on the authority of *Saura* (*Sauroktah*) are retrograde, three myriads in a *kalpa*. This is the same with the motions of the solstice as affirmed by Munjala and others. But according to their doctrines, its revolutions are 199,669 in a *kalpa*."

The mean periods of orbits are usually stated in Indian works of Astronomy, just as Bhaskaracharya has stated them in the above passage, as so many revolutions in a *kalpa* of 4,320,000,000 years or in a *yuga* of 4,320,000 years.

Now, three myriads or 30,000 revolutions in a *kalpa* of 4,320,000,000 years is equal to  $7.8''$  per annum, and 199,669 revolutions in a *kalpa* are the same as  $59.9007''$  per annum.

As regards quantities, Bhaskara's calculations,  $7.8''$  per annum and  $69.9''$  per annum are wonderfully near our modern figures  $8.5''$  and  $58.7''$  a year; and the interesting question arises, whether Bhaskara's two *Krantipatagatis* did not refer respectively to what we have called the Indian sidereal error and the proper precession respectively. In other words, can Bhaskara possibly have meant to convey the following sense in his passage cited above?

"The meeting point of the ecliptic and equinoctial circles was in a particular year the zero point of sidereal longitude proper. Now the point of tropi-

cal longitude proper. Now the zero point of sidereal longitude proper recedes from the zero point of our ordinary sidereal longitude in daily use by  $7.8''$  for every year, while the zero point of tropical longitude recedes from our ordinary sidereal longitude by  $59.90007''$  per annum.

It may seem an undue straining of Bhaskara's language to endeavour to extract this meaning from it but there can be no doubt that Bhaskara mentions two recessions of longitude in Indian Astronomy, almost identical in quantity with those which we have found in fact to exist. Colebrooke was puzzled by Bhaskara's reference to so minute a recession as  $7.8''$  per annum, but unfortunately Colebrooke in the second volume of his "Essays" has merely cited the passage in order to drop the question the next moment, as one which he considered impossible to interpret properly. Whitney has also mentioned the matter casually in his notes to the translation of *Surya Siddhanta*. We need not attempt to untie the Gordian knot, but the fact that we should try to get hold of is this :—The modern rate of precession is  $50.2''$  per annum, while Bhaskara's rate is  $59.9007''$  per annum. The connecting link between the two precessions is the error or deviation of the Indian sidereal from the true sidereal year, amounting, according to our present knowledge, to  $8.5''$  annum. Bhaskara's rate gives a movement of precession (that is the Indian precession) at the rate of one minute every year or one degree in 60 years, whereas the *Surya Siddhanta* rate is  $54''$  per annum or one degree in  $66\frac{2}{3}$  years. Whitney observes in his translation of the *Surya Siddhanta* that the reference in that otherwise stan-



dard work to the subject of precession is very vague and reads as if it were an after-thought or interpolation, nay, that the language used by the *Surya Siddhanta* is applicable rather to a libratory motion of the equinoxes swinging backwards and forwards through an arc of  $54^{\circ}$  than to a regular orbit of  $360^{\circ}$ .

Whatever may have been the amount of information available on this subject when the *Surya Siddhanta* was composed, we know that by the time of Bhaskara *i.e.*, within 50 years after the composition of the second *Surya Siddhanta* Hindu Astronomers had somehow acquired a firm grasp of the nature and amount of the precession, and the weight of authority ever since has in this one particular respect leaned towards Bhaskara, and not at all towards the *Surya Siddhanta*.

I have often wondered why the learned Professor Jacobi, while adopting Bhaskara's table of *Udayasus* for calculation of the tropical longitude of the sun, elected to follow the discredited *Surya Siddhanta* rate of the growth of precession (3 degrees for every 200 years), rather than Bhaskara's rate of one minute per annum. I have shown that Bhaskara's rate carries us much nearer to the modern tropical longitude than the *Surya Siddhanta* estimate, and that on this one point subsequent Indian Astronomers rightly elected to follow Bhaskara rather than the *Surya Siddhanta*.

Nor am I sure that certain assumptions usually made in English works by writers dealing with the history of Indian Astronomy will not require to be revised in the light of the facts above brought forward.

I will mention one rather important but misleading assumption. It is well known that in the long period of uncertain duration anterior to A. D. 500 when the Indian year was tropical as to its commencement and luni-solar as to its divisions, but sidereal as to its duration, a change was made in the beginning of the year, *periodically*, that is when it was found that the constellation or Nakshatra that actually rose with the sun at the time of the vernal equinox was quite different from the traditional constellation marking at that epoch the commencement of the year ; and an important question in Indian Astronomy is, what were the periods or intervals at which such changes were made. I shall try to put the problem in plain language, since it is very important that every one should try to understand it. Supposing that at a particular period of Indian History the *Nakshatra Mrigasira* (for the sake of definiteness, we must suppose one particular point of *Nakshatra Mrigasira* which covers  $13^{\circ} 20'$  to have been at that time the zero point of celestial longitude) was the *Nakshatra* that rose with the sun at the time of the vernal equinox. We are supposing that at this epoch the Hindus had only one kind of year, that is a sidereal year, but that they expected that at the end of every year the sun would again be in vernal equinox and rising in  $0^{\circ}$  *Mrigasira Nakshatra*. Of course this was an erroneous expectation, because then as now, the vernal equinox was receding every year from  $0^{\circ}$  sidereal longitude at the rate of 50 seconds per annum ; but in the absence of means of direct observation of the sun's longitude, we may suppose that the mistake could have been discovered by our ancestors only when the month in which the sun was in vernal equi-

nox was not the first month of the year, as they expected it to be, but, say, the last month of the previous year. How long it may have taken them to discover their mistake is the question which has to be determined, but I may say at once, that the question must be determined with reference to two factors, one known and the other conjectural viz., (1) the actual rate of precession, which we know to be  $50''$  per year and (2) the sidereal error at the time, which is now  $8''$  per annum, but which may have been much larger in former times, depending as it did on the length from time to time of the Indian sidereal year.

Let us assume that at the epoch when the sun rose in  $0^\circ$  *Mrigasira* Nakshatra at vernal equinox, the sidereal error was not merely  $8''$  per annum as it is now, but six times as large, in fact as large as the precession itself viz., 50 seconds per year. (This is not an improbable supposition, as will presently be shown.)

Then at the end of each sidereal year, the Hindus of the time would expect the sun to be in vernal equinox and to rise in  $0^\circ$  Nakshatra *Mrigasira*, whereas the longitude of the sun at vernal equinox would really be receding from  $0^\circ$  *Mrigasira* at the rate of  $50''$  plus  $50'' = 100$  seconds of a degree per annum. This recession of the longitude would amount to  $26^\circ 40''$  the space of two Nakshatras in

$$\frac{26^\circ 40'' \times 60 \times 60}{100} = \frac{80}{3} \times 36 = 960 \text{ years, or in round}$$

figures not more than a thousand years. That is, at the end of a thousand years, when they still hoped against hope (for appearances were quite to the contrary) that the sun would rise in  $0^\circ$  *Mrigasira* at the



time of vernal equinox, they would have found that the equinox had happened about a month before, when the sun had been rising in  $0^\circ$  *Krittika* Nakshatra (the second Nakshatra to the west of  $0^\circ$  *Mrigasira*). Disappointed in their expectation of the sun's movements, they would put back the beginning of the year to the date of the sun's rising in  $0^\circ$  *Krittika*, that is, they would drop a month and begin the year a month earlier. They would, at the same time, have had the fact of precession forcibly thrust on their notice in some form, though it would be obscured by their own sidereal error, and they would have noted that the rate of precession or anticipation in the commencement of the year) was  $100''$  or  $90''$  or  $80''$  or  $120''$  per annum, according to their estimate of the epoch when the sun had actually risen in  $0^\circ$  *Mrigasira* Nakshatra at the time of vernal equinox. Regretfully, they would give up the  $0^\circ$  *Mrigasira* as the commencement of the civil year, but they may have kept up a commemoration of it in their religious calendar.

At the epoch when the commencement of the year was fixed in  $0^\circ$  *Krittika*, that is, when the sun rose with that point of Nakshatra *Krittika* at the vernal equinox, we may suppose that instead of determining the amount of precession, it was more natural for our ancestors to have corrected the length of the year itself and the correction, if any in fact took place, would have again depended on the length of time during which they supposed their error to have accumulated. We assumed that the precession or gradual shortening of the year rose to  $26\frac{2}{3}$  degrees or 27 days in a thousand years, but they may have supposed that the year had been shortened to this extent within a period of

only 500 years ; or on the other hand they may have supposed the error or deficiency of the year to have accumulated during a period of thousand years. In any case, the correction made by them in the length of the year would depend on their estimate of the period of accumulation of error. Let us suppose they corrected the length of the year in such a way that their new sidereal error was  $9.8''$  per annum, instead of  $50''$  as heretofore, the true precession being  $50.2''$  as it always has been. Now their total precession

being  $60''$  per annum, it would be  $= \frac{80}{3} \times \frac{60 \times 60}{60} = 1600$

years before they would be obliged to shift the commencement of the years again by two Nakshatras to the west, *i.e.* to  $0^\circ$  Asvini. Two shiftings of the commencement of the year would probably suffice to demonstrate to them the existence of a *tropical*, as distinguished from a *sidereal* year, and being called upon to choose their future mode of reckoning the year, they may well have decided to stick to the Nakshatra  $0^\circ$  Asvini as the commencement of the year for ever and also to keep their estimate of the precession at the latest figure, namely  $60''$  per annum.

I do not wish you to believe that the commencement of the Indian year was only shifted twice in the space of 2000 years, or that any of the shiftings and corrections actually took place in the manner I have supposed, or lastly, that degrees of celestial longitude were measured by our ancestors with the precision I have assumed. All that I wish to bring home to you is that the interval between two successive shiftings in ancient times of the commencement of the Indian solar year is to be measured, not as Mr. Tilak measures it at

p. 19 of his *Orion*, by the modern rate of precession 50'' per annum or 1 degree for every 72 years =  $26 \frac{2}{3}$

80

degrees for— $\times 72$  or 1920 or nearly 2000 years, but by

3

a rate which must have been a compound of the true precession and the sidereal error of the time. I have shown that by supposing a sidereal error of only 50'' per annum, which would make the sidereal year of the epoch 365·27 days (instead of 365·25 876 days as now), we *ipso facto* suppose the shifting of the Nakshatra corresponding to the sun's 0° tropical longitude to have taken place once in 1000 years instead of once in 2000 years as assumed by Mr. Tilak. Mr. Tilak's theory as to the antiquity of the Vedas has been attacked on philological grounds by such eminent authorities as the late Professor Whitney and the present Dr. Thibaut, but I hope I have shown that even on astronomical grounds, where it seemed strongest, it really is not so secure. If there was an epoch of vedic civilisation when the sun rose in *Mrigasira* Nakshatra at vernal equinox, then there is every reason to suppose that at that epoch the Indian sidereal error was much larger than 50'' per annum which is the same as saying that the then length of the tropical sidereal year was more than 365·27 days. If so, the periodical shifting of the commencement of the year must have taken place in vedic times more frequently even than once in every 1000 years. All this would very materially affect the course of Mr. Tilak's argument in his *Orion* as well as the conclusions to be drawn therefrom.

As Mr. Tilak's *Orion* is not very easy to procure, I



will set down for the information of those who are curious to know more on the subject the principal facts relied on by Mr. Tilak.

Firstly, Varahamihira, in whose time *i.e.*, *circa* (500 A. D.) as is well known, the coincidence of the three longitudes I adverted to above occurred, observes as follows in his *Panchasiddhantika*—

“When the return of the sun” (*i.e.* the *Dakshinayana* or summer solstice) “took place from the middle of *Aslesha*” (*i.e.*  $120^{\circ}$  sid. long.) “the tropic was then right. It now takes place from *Punarvasu*” (*i.e.*,  $93^{\circ}3'$  trop. or sid. long.) (*Orion*, p. 37.)

Secondly, the *Vedanta Jyotisha* notes the position of the four principal points of the ecliptic as follows :— (1) The winter solstice in the beginning of *Avishthā* or *Dhanishthā* ( $293^{\circ}3'$  sid. long), when the sun and moon were together (the new moon, by present reckoning, must have been that of Lunar Magha): (2) the vernal equinox was in 10 of *Bharani* (sid. long.  $23^{\circ}3'$ ); (3) the summer solstice in the middle of *Aslesha* ( $=120^{\circ}$  sid. long.) this must have been the ancient summer solstice referred to by Varahamihira): (4) the autumnal equinox in  $3^{\circ}20'$  of *Visakha* ( $=202^{\circ}3'$  side long). *Orion*, p. 38.

Thirdly the *Taillirya Samhita*, in giving directions as to the time best suited for the commencement of the *Satras*, or annual sacrifices, observes *inter alia* that the *Phalguni* full-noon, and the *Chitra* full-moon are in some sense, not clearly explained, but left to be inferred, the “mouth of the year.” *Orion* p. 47.

Mr. Tilak infers, and we may assume for our present purpose, that he infers rightly, that though the Magha full moon was, in the time of the *Taittiriya Samhita* the winter-solstice and therefore the commencement of the year, there had been a time or times when the *Phalguni* full moon and still earlier times when the *Chitra* full moon, had stood at the winter-solstice, and therefore at the "mouth of the year,"

Now between the *Vedāṅga Jyotiṣa* and the *Panchasiddhantika* we would not be left to conjecture as to the lapse of time, if the two vernal equinoxes above referred to were correctly recorded, for we would have merely to multiply the interval in degrees ( $23.3^\circ$ ) by 72 years. We get  $70/3 \times 72 = 1680$  years and the date of the *Vedāṅga Jyotiṣa* is, on this assumption, located by Mr. Tilak, 1680 years before 500 A. D. i. e. in B. C. 1180 (*Orion*, p. 38).

We shall return presently to the question of the validity of this assumption, but regarding the period of time necessary to put back the commencement of the year by one month or two Nakshatras, I think we must pause before accepting Mr. Tilak's estimate. I shall put the problem in a very palpable form. Suppose we now wanted to adopt a tropical year, as so many people in India want to do, should we drop 23 days in the year 1911 A. D., taking the sidereal error into consideration, or only 19 days, taking only the true precession into consideration? Clearly, we should drop 23 days, not 19, so as to get our year to begin on March 21. Or if we should wait until we had to drop a whole month, as our ancestors did, we would have to wait, not until the precession proper mounted up to

30 days *i. e.* for  $(30 \times 72 =)$  2160 years from 500 A. D., but only for  $(30 \times 61 =)$  1860 years from 500 A. D. If the difference between the two supposed periods is 300 years for a sidereal error of  $8''$  per annum, a simple rule of three shows us that in ancient times when the sidereal error was much larger (I assumed above an error of  $50''$  per annum, but this is a very moderate and a comparatively modern error) the shiftings of the first month of the year to suit the vernal equinox may have happened at intervals of 1000 or even of 500 years.

Other reflections naturally suggest themselves *apropos* of this investigation. If it is a fact that the so-called fixed Indian ecliptic is not really fixed but has at present a slow motion of almost  $8''$  every year, it occurs to one to enquire whether the Indian Astronomers were not aware of this fact, and whether they did not deliberately and with full knowledge of the consequences adopt the *anomalous* year as their regular solar year, having regard to the advantages of easy computation fully illustrated in my "Indian Chronology." We do not suppose that a knowledge of the length of the true sidereal year, if it ever was theirs, came to them otherwise than as the result of prolonged trial and repeated errors. There must have been a time when they knew of only one kind of a year, and that they kept it as a sidereal and also, as far as possible, as a tropical year. Their first efforts must have been directed towards reducing the magnitude of their sidereal error, which must have perturbed equally their observations of nakshatra risings and of equinoxes. Except at the long intervals of time when they actually shifted back among the nakshatras the commencement of the year, they presumably regulated the



year and all their religious observances, so far as nakshatras were concerned, by calculation : but they also took care to record in what nakshatra the Sun was by calculation when he was in a solstice or in an equinox as determined by observation. Reading the *Vedanga Jyotisha* in the light of these remarks, we may suppose the nakshatra places there recorded to be, not the true sidereal longitude (in the modern sense or in the sense of Varahamihira); but a sidereal longitude affected by an unknown amount of sidereal error. If today we determined by the rules of Indian astronomy what was the nakshatra longitude of the Sun at Vernal equinox, our sidereal longitude would, as already observed, be affected by an error of  $3.267^{\circ}$ . The sidereal error at the time of the *Vedanga Jyotisha* may have been greater or it may have been less than  $3^{\circ}$ ; but there is reason to infer from the passage of Varahamihira cited above that the artifice of shifting the commencement of the year by one month ( $30^{\circ}$ ) was resorted to when the equinox fell back by the space of two nakshatras ( $26^{\circ} 40'$ ). If so, the sidereal error, was removed as soon as it reached a maximum of  $3^{\circ} 20'$  and a fresh start was made with a fresh nakshatra and an earlier month for the commencement of the year.

Many other speculations may be indulged in while we are dealing with such ancient times and such an uncertain factor as the sidereal error, from time to time, of Indian Astronomy, but the task I set before myself was to bring as clearly before you, as it was possible to do in unmathematical language, the limits of such speculations arising from our defective know-

ledge of the exact length of the vedic tropico-sidereal luni-solar year. I am confident that competent mathematicians, of whom I see several in the company that has done me the honour of listening to me to-night, will take up the investigation and carry it to its legitimate conclusions.

*Exoriare aliquis nostris ex ossibus ullor.*

