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## Father J. Richaud and early telescope observations in India

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**Abstract.** Father Richaud who discovered the binary nature of  $\alpha$  Centauri from Pondicherry is probably the first person to use a telescope on Indian soil. A brief sketch of his life and astronomical contributions from India are presented.

*Key words:* double stars—lunar eclipse—comets—zodiacal light—dark clouds—Fr J. Richaud—history of astronomy

### 1. Introduction

1689 December 19 stands out as an important date in the history of astronomy in India. It was on that day that a telescope was used for the first time on Indian soil, by Father Richaud, a member of the society of Jesuits, stationed at Pondicherry, to make stellar observations. This was barely eighty years after Galileo had invented the telescope and looked at the moon, discovered the satellites of Jupiter and found spots on the surface of the sun. One of the first objects that Richaud trained his 12-ft telescope on was the bright star alpha Centauri in the southern skies, which is inaccessible to the observers in the north. Richaud found that  $\alpha$  Cen is a double star. Alpha Centauri is the second double star to be discovered, the first being alpha Crucis discovered by Father Fontenay a confrere of Father Richaud, at the Cape of Good Hope in 1685 (Henroteau 1928).

### 2. Early life of Father Richaud

Jean Richaud was born 1633 October 1 at Bordeaux, France. After his early schooling, he entered the Jesuit mission at the age of fifteen and two years later took his vows. Like his fellow priests he underwent rigorous training and studied philosophy including logic, physics and metaphysics at the Royal College at Pau. For some time he taught logic and physics at several colleges and later, 1668–1686, taught mathematics at Royal College at Pau (Louyat 1982).

Even while in France he had shown keen interest in astronomical observations. *Journal des Scavant* of 1684 makes a mention of the solar eclipse observations made by Father Richaud at Pau on 1684 July 12. He also observed a comet between

1686 September 7–15. In recognition of his good work he was one of the fourteen Jesuits chosen by Louis XIV to leave for Siam as a part of the diplomatic mission on the invitation of the king of Siam. Before their embarkation Louis XIV honoured the fourteen Jesuits by issuing certificates establishing them as 'Mathematicians of the King of France'. They left France on Saturday 1687 March 1 and the journey took seven months nineteen days.

Father Richaud continued his astronomical observations while at Siam and along with his colleagues even set up an observatory at Louve with a 12-ft telescope. The king of Siam was very helpful in giving them the necessary instruments. However, in 1688 a palace revolution broke out in Siam and the Jesuit priests had to leave in haste. From Siam, Father Richaud and a few of his colleagues reached Pondicherry 1689 February 17. In one of the letters written by Father Richaud from Pondicherry dated 1690 August 21, preserved at the archives of the Jesuits, Paris, he says "we are not more than three from all those who arrived from Siam". His other colleagues seem to have succumbed to the hardships. Father Richaud did not lose any time in pursuing his astronomical interests at Pondicherry. Immediately after his landing there he continued his work with the help of the 12-ft telescope which he seems to have carried from Siam.

### 3. Astronomical observations made at Pondicherry

#### *Comet of 1689 December*

Father Richaud is credited to be the first astronomer to observe the comet of 1689 December. He started his observations on December 8 and gives a detailed account of his observations from December 8–21 which is reported in *Memoirs of the Royal Academy of Sciences of Paris*.

#### *Discovery of the double star*

The observation of the comet enabled him to make the discovery of the double star  $\alpha$  Centauri. He actually spotted two double stars,  $\alpha$  Centauri and  $\alpha$  Crucis. The latter had been earlier discovered by Father Fontenay. In Richaud's words "On several occasions while looking at the comet through the 12-ft telescope I noticed at the feet of Centaur a most eastern and a more brilliant star, which was a double star, similar to the one at the feet of Crusade; the difference being that in the Crusade while looking through the telescope one star seemed particularly away from the other, whereas at the feet of Centaur, the two stars seemed to be practically touching each other, even though one could distinguish them easily"\*.

Alpha Centauri had been a favourite object of many astronomers of Madras observatory since its beginning in 1792. T. G. Taylor, W. S. Jacob, E. B. Powell of Madras University and also N. R. Pogson observed this system.

#### *Lunar eclipse*

On 1689 April 4 a lunar eclipse took place exactly at the time indicated by Father Richaud, and a large number of French and a multitude of Indians came to watch it.

\*This and other quotations in the paper are free translations from the original French text.

#### 4. Determination of latitude and longitude of Pondicherry and of San Thome

Father Richaud corrected the longitude and latitude of Pondicherry and all through Coramandel coast. *Memoirs of the Royal Academy of Sciences* record the interesting way in which the latitude and longitude of Pondicherry were arrived at. The longitude of Pondicherry is  $100^{\circ} 30' E$  with reference to the island of Fer which implies that it is  $78^{\circ} E$  with reference to the meridian of Paris and  $80^{\circ} 20' E$  with reference to that of Greenwich. In the actual map this longitude is  $79^{\circ} 53' E$  with reference to the meridian of Greenwich. As regards the latitudes of Pondicherry, he estimated it to be  $11^{\circ} 53' N$  whereas it was indicated as  $12^{\circ} N$  in the maps of that time, as  $12^{\circ} 28' N$  by Riccoli and  $12^{\circ} 30' N$  by Duple. In today's map this latitude is  $11^{\circ} 56' N$  very close to the value  $11^{\circ} 53'$  calculated by Father Richaud. In the same issue of the *Memoirs of the Royal Academy of Sciences* Father Richaud reports that he had a chance to go to San Thome in 1690 July. He calls it a 'famous city of India' since it was here that St Thomas lived and preached Christianity. Father Richaud fixed the latitude of San Thome at  $13^{\circ} 10'$  very close to the currently accepted values  $13^{\circ} 9'$ .

#### 5. Observations of zodiacal light

We quote him again: "As early as 1683 one had observed at Paris an extraordinary brilliance which appeared just before the sunrise and just after the sunset along the length of the ecliptic path near the sun. The same light was observed in Siam in the year 1686 and 1687. We have even observed it many times in Pondicherry in 1690. It was very large and stretched itself practically through the length of the equator. After the setting of the sun it rose to more than 40 degrees. In addition, I noticed that slowly it changed its places advancing a little towards the north with the sun descending much below the horizon and also when it approached it. This brilliance was still visible at 9 O'clock in the evening with the sun having set around 6 O'clock".

#### 6. Dark clouds near Coalsack

Father Richaud not only observed the two clouds of Magellan but also reports the existence of two dark clouds toward Coalsack. "Other than this\* there are two great, black patches which were not yet indicated in the maps. The first one is rhomboidal in shape and follows close to the southern cross. The patch which is facing the pole is irregular and stretches more than the one which is in opposition to it and bends a little towards the Triangle. The other patch is not so well defined in the sky, and has a very irregular shape, composed practically of patches, one over the other, scattered over the branches of the chain of Charles: they are even merged at their border with one part of the Milky Way which is common with the others".

"No one, as I think has, up to now spoken of these celestial patches except the report relating to the clouds mentioned by Jesuit Father Joseph d' Acoste, in his *Natural History of India*, book 1, chapter 2. In fact, this Father reports what he

\*i.e. Magellanic clouds.

A. S. Thome 23 febr.  
1691

Monsieur

je viens vous maintenant de recevoir votre lettre. je me  
sentois bien que vous ne tarderiez pas beaucoup à me faire  
savoir de vos nouvelles. Cependant je crains bien que vous  
sachiez que j'aurois voulu de vous précéder, ce que dès ce  
matin j'ay dit à Mr Chamet et à Mr Pinto que j'allois vous  
écrire. Pour le P. Solu, quelque bonne volonté qu'il eust sans  
doute de le faire, il ne m'auroit point encore marqué que vous  
me saluiez. Il faut cependant que vous ayez bien que moy luy  
pardonner cela. Je le prie pour se tenir auprès de Madame la  
Directrice afin de luy servir d'interprète. J'ay en d'autres manières  
l'honneur d'affaires de mesme bien que nous l'occupation, si l'  
nous oublie quelque fois mais ce n'est affez qu'il n'en a pas  
moins d'affection. Je vous écris comme vous que tout ce dernier  
allarme de Pudichon se terminera comme les précédentes. Dans  
le fruit de ce pour le repos de tout le monde. Je m'excuse  
de vous en complimenter à Madame la Directrice. Je ne doute  
pas qu'elle n'y prenne plaisir. Ne vous presser, pour tant pas  
de venir au devant d'elle. Si Pudichon la demande, si Thome  
aussy si vous avez auant de luy qu'il se pourra. Ne vous  
allons pas faire une nouvelle guerre à son occasion avec Messrs  
les Portugais, qui se facheront ou plustost se souffriront pas de la  
perdre si tost. Laissez conduire la Providence, et attendons qu'elle  
vra vaille avec vous. Adieu. Je me recommande très particulièrement  
à vous bien de la confiance à nos M. A. de priery

Monsieur

je salue bien vos M. A.  
Car je suppose qu'il n'est pas  
encore enfoncé dans les bois.

Vostre très humble et très  
affectionné serviteur  
J. Richaud

Figure 1. A copy of the letter written by Fr Richaud from San Thome 1691 December. (Courtesy: Archives, Mission Etrangères de Paris).

himself saw, towards the south pole, two highly remarkable black patches and that it opposes the colour of the Milky Way : he was highly surprised that he had only heard of the two white clouds which had a lot of resemblance to the Milky Way. Whatever be it I have said what I have observed many times”.

These are some of the astronomical contributions Father Richaud made from India. He was not only interested in practical work but also taught astronomy at the new school opened by Jesuits in San Thome. On 1693 April 2 Father Richaud died while still in Pondicherry. C. Sommervogel's "bibliotheque de la Cie de Jesus" 1813 wrongly reports that Father Richaud died in Siam. This led to some confusion and there were doubts whether Father Richaud ever came to India. Fortunately *Archives* of the Foreign Missions, Paris, still preserve the unpublished letters written from India. A sample of a letter written by Father Richaud, himself when he was in San Thome is shown in figure 1. In addition, there are three other letters written from Pondicherry by his fellow Jesuit priests which refer to Father Richaud's death. The first and the second letters mention the death of Father Richaud and his burial on 1693 April 3 in Pondicherry itself. The third letter from Father Tachard pays tribute to his friend. He says 'Father Richaud was a man of science and a religious saint, who could establish harmony between scientific culture and his religious belief'. Unfortunately our efforts to locate the grave have not been successful since it is believed to have been destroyed during the war with the Dutch. We are trying to get more information regarding Father Richaud's stay at Pondicherry and San Thome, Mylapore. We hope to get some records of his work in India from these two places.

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