

NOVA NOTES

VOLUME 31 — NUMBER 4 — AUGUST 2000

THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC
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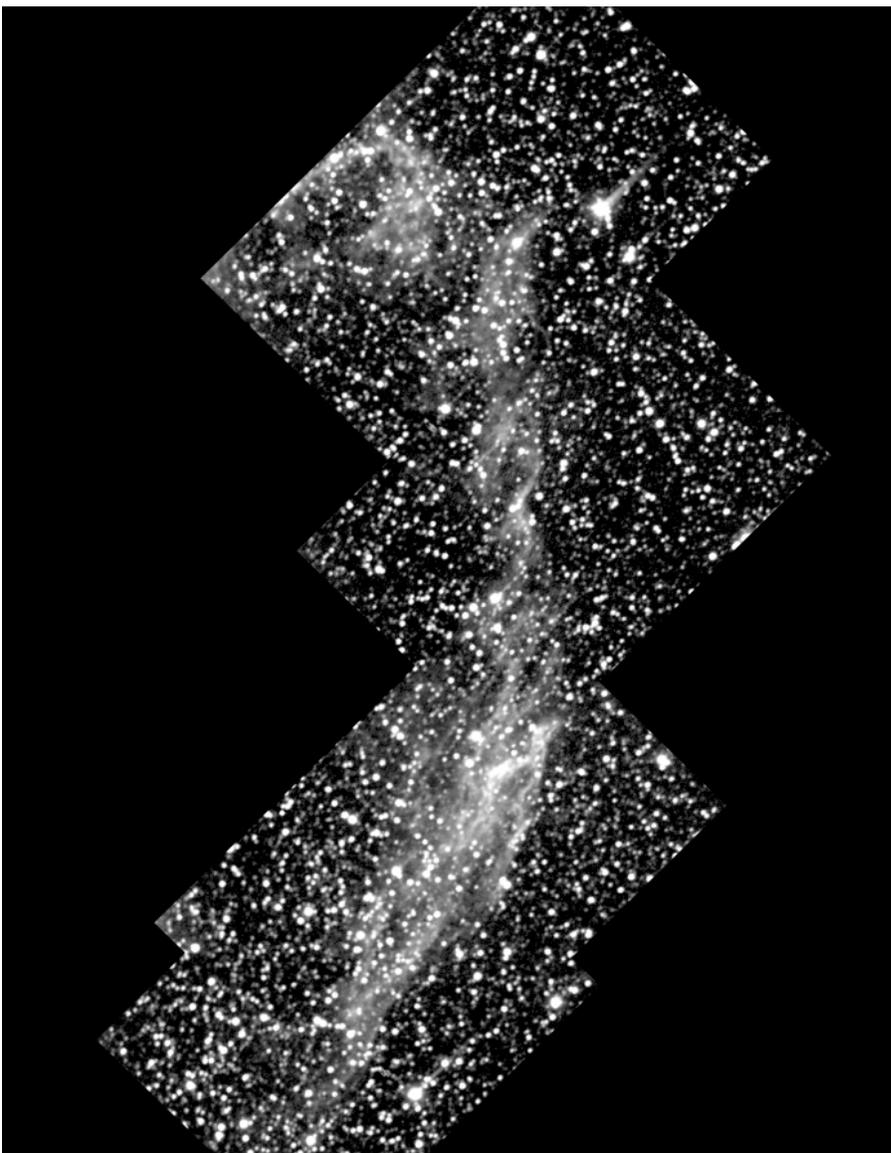
THANKS FROM THE NOVA EAST 2000 COMMITTEE:

Our philosophy behind Nova East 2000 was to encourage individuals from local astronomy clubs to get involved in a star party. We strongly believe that everyone has the knowledge and ability to contribute in some way to the enjoyment we all share in when attending a star party. This year we had a legion of people come forward and help out, and we extend our sincere thanks to all of them in helping to make Nova East 2000 a co-operative success.

For those readers who may not know them all, they are mentioned below. If you happen to cross paths with any of them, and you enjoyed Nova East 2000, remember that your compliments are the only remuneration these people get, so please pass yours along.

Public Programs

Mel Langille (NCAC) Saturn V launches
Eric McNutt (NCAC) Public Observing
Co-ordinator
Joanne Thompson (NCAC) Park



ASTROPHOTO OF THE MONTH — MOSAIC OF THE VEIL NEBULA

Image of the Vail Nebula taken recently by Blair McDonald with his CCD camera.

Campers Publicity
Public Observing
Reg Henderson (NCAC)

Jeff Dalton (MAG) David Chapman
(RASC Hfx) Mary-Lou Whitehorne
(RASC Hfx) Toilet Paper Solar System



NOVANOTES,

THE NEWSLETTER OF THE **HALIFAX CENTRE OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA**, IS PUBLISHED BI-MONTHLY IN FEBRUARY, APRIL, JUNE, AUGUST, OCTOBER, AND DECEMBER. THE OPINIONS EXPRESSED HEREIN ARE NOT NECESSARILY THOSE OF THE **HALIFAX CENTRE**. MATERIAL FOR THE NEXT ISSUE SHOULD REACH THE EDITOR BY **OCT 20TH, 2000**. ARTICLES ON ANY ASPECT OF ASTRONOMY WILL BE CONSIDERED FOR PUBLICATION. "LETTERS TO THE EDITOR" OR TO OUR RESIDENT EXPERT: GAZER ARE ALSO MOST WELCOME. CONTACT THE EDITOR AT:

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Roger Langille (NCAC) Clint Shannon (RASC Hfx) Mike Gatto (RASC Hfx) Darren Talbot (RASC Hfx)

Daryl Dewolfe (MAG) Sky Lore
All the observers on the "Hill" for sharing their observing time with the public who wandered up there.

Astro Programs

Doug Pitcarin (RASC Hfx) Astro-Talk
Dr Roy Bishop (RASC / MAG) Tides of the Bay of Fundy talk
Sherman Williams (MAG) Smiley's Interpretive Hike(s)
Clint Shannon (RASC Hfx) Solar Observing
Reg Henderson (NCAC) Solar Observing
David Lane (RASC Hfx) Collimation Workshop
David Chapman (RASC Hfx) Sundial Workshop

Organization

Paul Evans (RASC Hfx) N.E. 2000 Committee, Programs
John Jarvo (NCAC) N.E. 2000 Committee, Registration
Daryl Dewolfe (MAG) N.E. 2000 Committee, Park Liason and Publicity
Irene Moore (MAG) N.E. Registration
David Lane (RASC Hfx) N.E. 2000 WebSite manager, N.E. 2000 T-Shirts
Dr William Thurlow (AAC) N.E. 2000 Door Prize Donations
Mike Gatto (RASC Hfx) N.E. 2000 Brochure design & Printing
Jeff Dalton (MAG) "Welcome to Nova East" sign artist
N.E. 2000 Committee Advisors; Dr Roy Bishop (MAG), David Lane (RASC Hfx), and Eric McNutt (NCAC)
Steve Tancock (RASC Hfx) Nova East Clubs Banner
Shawn Mitchell (RASC Hfx) Brochure Distribution

Our Appreciation also goes out to Smiley's Provincial Park staff for their co-operation and assistance in making everyone feel welcome. And to the Parks are for People staff for their publicity help and for their Campground Host Program. We were blessed with sunny days and stars at night. See you next year.

Paul Evans (RASC Halifax Centre)
John Jarvo (Nova Central Astronomy Club) Daryl Dewolfe (Minas Astronomy Group) Ω

APRIL MEETING REPORT: BY PAT KELLY

After the usual introductory comments, Former President David Chapman started things off by showing members a telescope which had been donated to the centre. He had received a call from someone who wanted to give it a home where it might be put to use, and since he wasn't too far away, he had volunteered to pick it up and bring it to the meeting. As the centre already has a number of working telescopes, the executive decided to place an ad for it in *Nova Notes*, with the proceeds going to the centre. (He also made it quite clear that, due to its size, he had no intentions of taking the telescope back with him! This writer volunteered storage space for it in Doug Pitcairn's office until it was sold) It is an 8-inch reflector (the mirror needs re-coating), with afocal ratio of about f/8, and no mount. The best way to describe the scope is that it is a real fixer-upper!

Next up was Former President Dave Lane, who showed us an interesting item that he had brought back with him from the last national council meeting. It is a laminated star chart/ planisphere that is being made as a fund raiser by Rob Dick of the Ottawa Centre. It is a very nice item, and its size means that it can also be used as a great place mat so that you can plan your observing while having dinner! The centre will be getting some in the near future to add to our inventory of astronomical fundraising items. Dave also wanted to remind members that this year's General Assembly was being held in Winnipeg and he had several brochures for members who might be interested in attending.

The meeting continued with What's Up, by "Soon-To-Be-

President Paul Evans". (We have him tentatively scheduled for the years 2004 and 2005!) With spring being upon us, he noted that we were reentering galaxy season. For non-astronomers, this period of time is also referred to as the Stanley Cup playoffs'. He showed a chart of the main region of the Virgo Cluster and pointed out several of the "must see" galaxies.

There had been talk last month of the possibility of trying a Messier marathon. Dave Lane had tried, but had only gotten about 40 objects before a combination of clouds and cold coffee brought his marathon to an end. Soon-To-Be-President John Jarvo (2006-2007) reported that he had managed to get 50 Messier's before the sky conditions deteriorated. Next year, the New Moon will occur at a more favourable time, so better result should be expected, weather permitting. Our guest speaker, Michael Watson, reported that he and Randy Atwood (our national president) had attempted a marathon from an area south of Hamilton, and they had only been able to get 74 objects. A few days later, however, Michael had been just outside of Tuscon and had tried again, this time netting 108!

We then started the main presentation for the evening. Michael Watson is an unattached member who lives in Toronto. He is currently the society's treasurer and was in the Maritimes to talk to two groups (one in Moncton, one in PEI) who were interested in becoming RASC centres. He was able to adjust his schedule so that we could have him speak at our April meeting. He has given presentations at many recent General Assemblies, all of which were well received and he has also given presentations to other centres. Some readers may recall that he gave a multimedia presentation to the Halifax Centre some year's back. It was called "South of Capricorn"

and documented a trip that he had made to the southern hemisphere to pursue his hobby of astrophotography.

Michael began by giving a brief history of the role of computers in amateur astronomy and how they had advanced it's capabilities. He also painted out that there are inherent dangers involved when combining computers with astronomy. He recounted a story of a society member who, in the mid-1980s, was observing with the use of a new piece of computer hardware, namely digital setting circles. While searching for various objects, there was one that he recorded as having been observed, even though he could not see it, because the setting circles told him that it had to be in the field of view of his telescope. He noted that if the society adopted this kind of philosophy, it could start giving out Quasar Certificates!

Many planetarium programs are now so realistic that they can actually divert a lot of people from looking at the real sky Ñ but this has its advantages, since you can actually use the computer to watch events that you cannot actually see due to bad weather! The two programs that he uses most often are Dave Lane's *Earth-Centred Universe* (ECU) and *Red Shift*. He has found that they are intended for different uses, and compliment each other nicely.

One of the main things that he uses these programs for is to predict future astronomical events. Predictions available in books or almanacs are usually only for the current year, or one of two years into the future. With planetarium software, one can now search into the far future for events, or relive astronomical occurrences of the past. In fact, for some types of astronomical phenomena such as the maximum elongations of Venus, or the retrograde motion of Mars, a computer simulation is better than

the real thing as an aid to understanding. In studying past events, he ran into his first big computer problem. He had used the first version of ECU to explore many past events. By the time version two came out, he had saved thousands of configuration files only to find that they could not be read by the new version of ECU! Fortunately, by then, he and Dave Lane had met on numerous occasions through the RASC, and with some pleading on Michael's behalf, Dave wrote a small program to convert the files.

An aspect of planetarium programs that Michael has been researching lately is their accuracy at depicting events. It turns out that there are very few astronomical events for which both an exact time and exact location are known. One such event occurred in 1941, when an observation of the Moon occulting Mars was made at an observatory just outside Manila, in the Philippines. Like most software, ECU reproduces the event to about one minute. The same cannot be said of one of the newer pieces of astronomical software. *Epoch 2000*, from Meade, has problems with past events. In one case, an occultation is not only two days late, but the objects involved do not even produce an occultation.

We took a trip into the past to look at various configurations of the planets and bright stars that may have been interpreted as the Christmas Star. There were a lot more that I was aware of, including one instance where Jupiter and Regulus would have come so close together that they would have appeared to be a single star.

By speeding up time, there are patterns in the motions of celestial objects that become readily apparent. One of these is the effect of precession on the Moon's orbit. When sped up, the path of the Moon near the Pleiades shows why the Moon only passes through that

cluster every 18 years. The next series of series will be in 2006, with the best passage taking place on the night of April 1st (and Halifax is more favourably located than Toronto). Mark that date on your calendar!

Another set of patterns that are interesting to watch are the retrograde loops formed by the outer planets. The sizes get noticeably smaller as you move to the planets that are farther and farther from the Sun. Additional features of their orbits become noticeable as you observe the motions for longer periods of time, such as the line of nodes, which can be seen when the planets cross the ecliptic. In the case of Pluto, the eccentricity of its orbit is readily apparent, as its motion across the background stars can be seen to speed up and slow down over the course of its orbit.

The retrograde motions of comets also show some interesting characteristics. In the case of Halley's Comet, whose orbit lies relatively close to the ecliptic, the retrograde loops caused by the Earth's motion are quite elliptical, like those of the outer planets. When Comet Hale-Bopp is observed, the loops that it makes are almost perfectly circular. This is because its orbit is taking it due south of the solar system, and it is currently quite close to the south celestial pole.

Another interesting interplay to watch are the conjunctions of Jupiter and Saturn. When run in fast forward, one can easily see that triple conjunctions (when the two planets pass each other three times) are formed by the retrograde motions of the two planets. If they are too far apart when at opposition, a single conjunction results. The current conjunction of the two planets will not be visible, as it will occur when both planets are in conjunction with the Sun, but we did have a preview of the next event, which will happen at Christmas 2020.

Switching over to *Red Shift*, Michael showed its capabilities for showing what the planets look like when sped up. Jupiter, for instance, displays an impressive increase in size when the Earth reaches its closest approach each year. Even more remarkable are the changes that happen to Mars. In addition to its changing size, the tilt of its orbit and its illuminated phase all show large shifts. When a favourable opposition occurs, the difference in size is truly incredible.

Any members who had a computer and did not own any astronomical software before this presentation, would almost certainly be planning on getting some soon! Ω

**THE SIMIAN CALENDAR:
BY GRAHM MILLER**

THE TABERNACLE. After fleeing slavery in Egypt around 1600 B.C., before entering the Promised Land of Canaan, the Israelites sojourned for "forty" (many) years in the Sinai Peninsula between Egypt and Palestine. After they left Egypt, the Lord, upon Mt. Sinai, delivered to Moses the ten commandments and further laws, and ordered him to have the people erect the tabernacle, a portable sanctuary in the form of a tent of the finest materials. The plans were minutely detailed (1,2). The enclosing fence formed a rectangular court, 100

cubits long on the north and south, and 50 on the east and west, with the gate towards the east. The dimensions must have been significant, for they were repeated in the court of Solomon's Temple on the mount above Jerusalem (3). The aim of this essay is to explain the perimeter of 300 cubits.

THE SAMIAN YEAR. 300 cubits seems like a round number for the number of days in the year: unconvincing until considered further -- it was the Samian year!

The wedding night [of Zeus and Hera on the Island of] Samos lasted for three hundred years: perhaps because the Samian sacred year, like the Etruscan one, consisted of ten thirty-day months only, with January and February omitted.

Robert Graves (4). As R. H. Allen has told us (5), Juno/Hera was associated with the midwinter Roman month Gamelion, corresponding with the zodiacal Aquarius.

THE WINTER SETTING OF VEGA. In a former paper (6), I argued that Zeus was the star Vega. Figure 1 is reprinted from there. The wedding night of Zeus and Hera is a

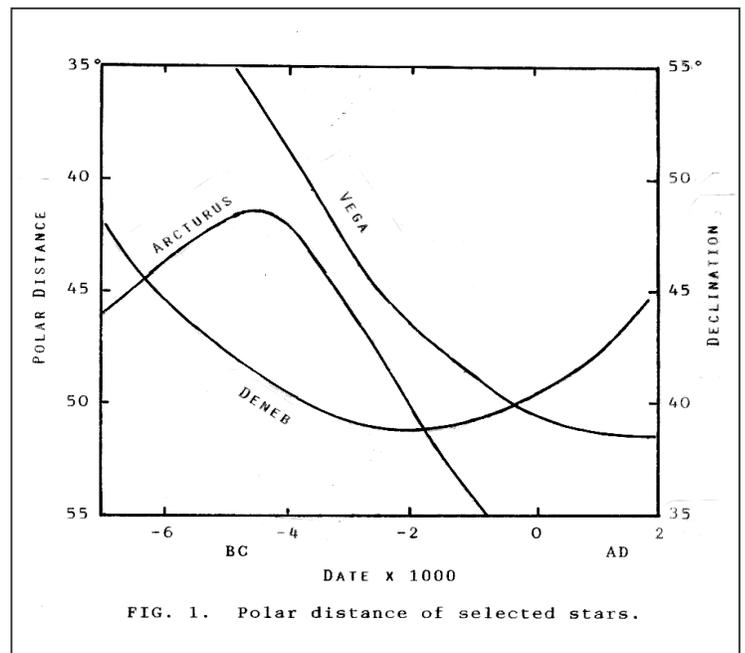


FIG. 1. Polar distance of selected stars.

myth implying that the star descended below the northern horizon during January and February. Figure 2 illustrates how that might have occurred anciently if the two months were before the solstice. I will come to that, but for the moment beg to dismiss in but few words the possibilities that the two months originally occurred after the solstice in keeping with the Roman myth, or one month before and one after.

As the millennia passed, Vega remained above Capricorn (Fig. 2). With the precession, the solstices and equinoxes rotated counterclockwise by one sign of the zodiac per 2150 years. Suppose the solstice were in Sagittarius, as it was in Roman times when the vernal equinox was in Pisces, then the deepest dip of Vega would fall near the end of our January. Thus in Roman times the myth was consistent with Zeus being in bed in January and February, but the era was too late to have any relation to the tabernacle. Again, if the solstice were in Capricorn, the equinox would be in early Aries, about 2000 B.C., shortly before the time of the tabernacle. It is to be argued, however, that the Samian year was already obsolete at that time. More likely then, the epoch for the formulation of the Samian calendar was as implied in Fig. 2, with the equinox in early Taurus, about 4000 B.C.

DATING THE SAMIAN CALENDAR. Figure 2 shows the equinox in Taurus, at approximately 3500 B.C. If it correctly represents the situation at the formulation of the Samian calendar, Zeus must have stayed in bed in the two months before the solstice. This seems reasonable if he were believed to awaken in welcome to the sun, reborn at the solstice. So for that epoch let it be postulated that, near the end of November, Vega had maximum dip at midnight, a stage in the nightly rotation called the

inferior culmination.

we knew at what latitude the prehistoric astronomers lived, we could, by another method, refine the date when they devised the Samian calendar.

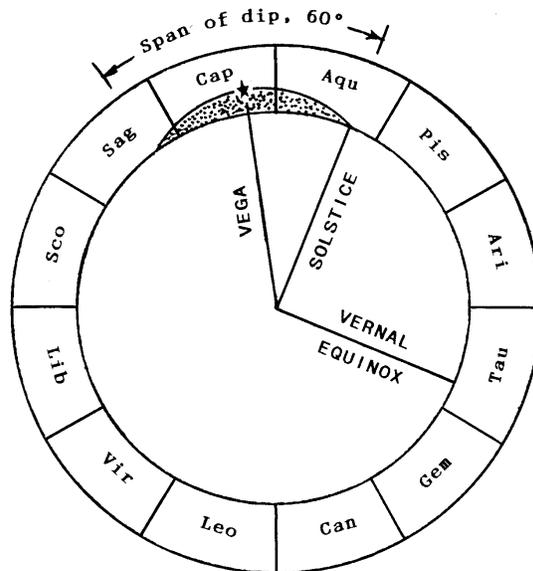


FIG. 2. Relationship of Vega to the winter solstice at about 3900 B.C. The diagram is schematic; Vega is not within the band of the zodiacal constellations.

In a previous paper (7) I reviewed evidence that the constellations were formulated about 3000 B.C. by people living at Lat 35 to 37°N. I have a planisphere with a window calculated for Lat 35°. For this analysis I set the pivot at the position of the pole for 3500 B.C. At that epoch, I found, Vega dipped at midnight in late November by 4 or 5°. The span of the dip extended from N30°W to N30°E, two months equivalence, although it was below the horizon just 4 hours each night. The dip of about 5° may be used to enter Fig. 1 for a better estimate of the date, to be read on the curve for Vega at an ordinate of 40°. It was 3900 B.C.

SYMBOLISM OF THE FENCE. Subash C. Kak and I (8) analyzed the meaning of the peripheral ring of bricks in the top layer of a Hindu fire altar dating to 1700 B.C. The ring symbolized the annual run of the sun on the ecliptic. As will be

perceived, the fence, as the outer boundary of the court of the tabernacle, was a much earlier expression of a similar concept, taking the sacred year to be 300 days: but 300 days in the cycle of Vega, not the sun. We may take it that Vega was the supreme ruler of the stars. For 300 days he was above the horizon at midnight. By the time of Moses the Samian calendar was obsolete, and must have been retained in the tabernacle out of tradition. Indeed, the breastplate of the high priest contained twelve jewels engraved with the signs of the zodiac, thus showing that a twelve month calendar had come in.

REVIEW. The fence around the tabernacle, having a perimeter of 300 cubits, was an expression of the Samian year, dating to 3900 B.C. By the time of Moses it was an obsolete calendar, and found place in the tabernacle only out of tradition. The perimeter may have represented the annual rotation of Vega about the pole.

REFERENCES.

1. Exod. 25ff and 35ff.
2. 1982, Encyc. Judaica, Keter, Jerusalem, 15:679).
3. I Kings 7:2.
4. 1959, The Greek Myths, George Braziller Inc., New York, 1:52.
5. 1963, Star Names, Dover, New York, 46.
6. 1998, Nova Notes, June.
7. 1995, JRASC 89:141.
8. 1999, JRASC 93:216.

Ω

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

Date: **Regular Meeting — Friday, Sept 15 at 8pm**; 7pm for the council meeting.

Place: Room L176 of the Loyola Building, Saint Mary's University. Access is from the parking lot behind the McNally building on Robie Street.

Topic: **Members Night and Nova East Report**

Date: **Regular Meeting — Friday, Oct 20 at 8pm**; 7pm for the council meeting.

Place: Room L176 of the Loyola Building, Saint Mary's University. Access is from the parking lot behind the McNally building on Robie Street.

Topic: **TBA**

BECOME A ST. CROIX OBSERVATORY KEY HOLDER

For a modest key fee, members in good standing for more than a year who have been briefed on observatory can gain access to the centre's new Observatory, which is nearing completion. To become a key holder, contact Observatory Committee Chair, Shawn Mitchell.

JUST WHERE IS THE ST. CROIX OBSERVATORY?

The Centre's Observatory is located in the community of St. Croix, Nova Scotia. To get there from Halifax (Bayers Road Shopping Centre), follow these simple instructions.

1. *Take Hwy 102 (the Bi-Hi) to Exit 4 (Sackville).*
2. *Take Hwy 101 to Exit 4 (St. Croix).*
3. *At the end of the off ramp, turn left.*
4. *Drive about 1.5km until you cross the St. Croix River Bridge. You will see a power dam on your left.*
5. *Drive about 0.2km past the bridge and take the first left (Salmon Hole Dam Road).*
6. *Drive about 1km until the pavement ends.*
7. *Drive another 1km on the dirt road to the site.*
8. *You will recognize the site by the two small white buildings on the left.*

ASTRO ADS

For Sale: one Meade off axis guider for sale. Price \$50.00 in perfect condition.

It came with CCD camera and I cannot use it on my Newtonian.

Contact Blair MacDonald at
b.macdonald@ns.sympatico.ca
or 902-445-5672

For Sale: Meade Series 4000 56mm 2" Super Plossl for sale. In excellent condition (rarely used) Asking \$225.

Email Darren Talbot at
dtalbot@ns.sympatico.ca
or call (902)443-9373



HALIFAX CENTRE EXECUTIVE

2000 HALIFAX CENTRE EXECUTIVE

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