

ARRIVING FROM MARS BY UFO?

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In recent years there have been many reports of unidentified flying objects (UFO's), especially since the first Soviet Sputnik went up on October 4, 1957. From time to time the question has been raised as to whether the UFO's might have come from Mars or Venus, perhaps bearing intelligent beings. Usually the answer to this question has been simply a guess which depended to a considerable extent on what the individual wanted to believe. Most scientists have been inclined to doubt that the UFO's came from Mars or Venus, preferring to credit the sightings to natural phenomena which are not as well known as they should be.

There is a logical approach to this question as to whether or not UFO's have come from Mars or Venus. It is well known that if someone on the earth wants to send a space vehicle to Mars or Venus, there are specific favorable times, times when a body can be launched so that it will travel along a minimum-energy orbit, arriving at the path of Mars (or Venus) just as that planet comes to the same point. For example, favorable times for launching a rocket to travel to Venus have been listed as Oct. 27, 1965, June 5, 1967 and January 11, 1969, and for Mars, December 23, 1964, January 26, 1967 and February 28, 1969. (SPACE HANDBOOK, Gov't Printing Office 1959.)

Of course, there are similar favorable times for launching a space vehicle from Mars (or Venus) to the earth, and for each of these launching times, there would be a corresponding arrival time at the earth. These favorable arrival times come at intervals of about 584 days for Venus and about 780 days for Mars. Actually, in each case, the interval is a close approximation to the synodic period of the planet; for Venus, the synodic period varies from 579.8 to 587.8 days, and for Mars, from 767 to 803 days.

One could then choose intervals of 20 days, say, ten days on either side of a favorable arrival date, and look to see how many UFO's were sighted in each such "favorable arrival interval", here named *fai*, (plural *fais*). If there were no increase in the number of UFO's in these *fais*, then it would be unlikely that any considerable number of UFO's had been arriving from Mars or Venus.

Someone is certain to raise the question as to whether or not a Martian or a Venutian would elect to travel in a minimum-energy orbit. Here I shall assume that intelligent beings from any part of the universe will choose to travel by means and paths that will minimize the expenditure of energy.

This *fai* approach to the problem can be carried a step farther. One can make a list of the UFO's observed in the *fais*, and look at the record of each to see if the UFO was observed travelling in the direction it would have if it came from Mars (or Venus) in a minimum-energy orbit. Roughly speaking, a space vehicle from Mars should overtake the earth from behind and one from Venus should be overtaken by the earth. Thus one could determine whether the path of approach was associated with the proper radiant point in space; here we use the term in the sense in which it is used in connection with meteors.

Now to look at the evidence! A list of UFO's sighted between September 8, 1956 and December 31, 1963 was examined. Nine *fais* of 20 days were found in this interval, 5 for Venus and 4 for Mars. Circular paths were assumed for Venus, Earth and Mars in computing travel times for space vehicles, but no particular difficulty is encountered if one elects to allow for the eccentricities of the various paths. In table I below, the number of UFO's reported in each *fai* of 20 days is given, and is to be compared with the average number of UFO's per 20-day interval outside the *fais*, namely, 1.88.