

Life On Mars?

Quotation from *THE UNIVERSE OF STARS*. Chapter on "Life in Other Worlds?" by Harlow Shapley. Cambridge: Harvard Observatory. Dr. Shapley is director of the Harvard College Observatory.

There are, I believe, at least seven absolute necessities for organic origin and development on a planet of this solar system. They are conditions that must be met to insure existence of water in a liquid form, and to insure environments otherwise suitable. If a planet conspicuously fails to fulfil a single one of these conditions, it probably fails as a possible abode for life. Even if it fulfils all these requirements, other factors may enter, and hinder high development of the terrestrial sort, or possibly even prevent the most lowly of origins.

For living is precarious. Organic reactions and reactors cannot endure severe hardships. They cannot withstand, except under very favorable conditions, the cruel buffeting of a material universe. Variations of temperature must be moderate, and extremes of temperature must be of short duration and quickly alleviated. Otherwise animate things return precipitately to the inorganic clay from which they sprung. Excesses of pressure cannot be borne by fragile earthly creatures. Life, as we know it, cannot even come into being if the chemical constitutions of soil and air differ very much from terrestrial conditions.

The seven conditions necessary to the existence of life may be briefly stated as follows:

1. The radiation emitted by the source of energy (the Sun in our case) must be constant in quantity and quality over a considerable interval of time.
2. The distance of the planet from the source of energy must fall within suitable limits, in order to maintain water in the liquid form on the surface.
3. The orbit of the planet must be approximately circular, because its distance from the Sun must not deviate greatly from its average value.
4. The planet must rotate with a satisfactory period, in order that the alternating conditions of day and night may be endurable.
5. For the same reason, the axis of rotation must be suitably inclined to the plane of the planetary orbit.
6. The mass, that is the amount of matter in the planet, must not be too small nor should it be too large, if higher forms of life are to be expected.
7. The chemical constitution of

the planet's covering of land, water, and air must conform to a very definite prescription for life of the terrestrial kind.

Venus, so far as we can see, more nearly fulfils the conditions than any planet other than the Earth. Its mass and orbit are certainly favorable, its distance, rotation, and chemical constitution are probably not unfavorable, but we cannot penetrate the dense covering of clouds and seek out the secrets of its surface.

Low forms of life may exist on the planet Mars, where the thin atmosphere does permit our telescopic explorations. High forms of life are generally deemed improbable at the present time, and beings comparable with man and other terrestrial mammals are considered utterly impossible. The frequent suggestion that we might exchange signals with organisms on Mars is, I think, extremely preposterous. Those absurd people who try or recommend such experiments should practice communicating with carrots and jellyfish. If they succeed in establishing relations in that field, they may have some luck with the Martians.

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GENERAL SCIENCE

Pioneers of Thought

Thoughts that great hearts once broke for

We breathe cheaply in the common air.

The dust we trample heedlessly

Throbb'd once in saints and heroes rare,

Who perished, opening for the race
New pathways in the common place.

Lowell: *Masaccio*.

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GENERAL SCIENCE

Truth, Clothed

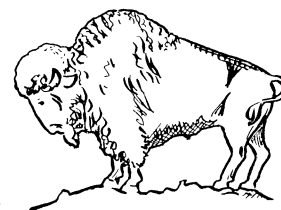
Quotation from Jean Henri Fabre, translated by P. F. Bicknell.

Truth, it is said, comes naked from the bottom of a well. Agreed. Nevertheless we must admit that it gains by being decently clothed. It demands, not the frills and furbelows of rhetoric, but at least a fig-leaf. Mathematicians, and they only, have a right to refuse it even this modest costume. In demonstrating a proposition of geometry, clearness is enough on the mathematician's part. But all others, and naturalists especially, ought to drape a tunic of gauze around the loins of truth, and to do it with some little regard to elegance of appearance.

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NATURE RAMBLINGS

By FRANK THONE



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Free Buffalo

This fall the U. S. National Park Service is again giving away bull bisons—surplus animals from the Yellowstone Park herd, which has now grown to a size that will admit of no increase, at least on its present range in the Lamar valley. Starting a little less than a generation ago, with a couple of dozen animals brought in from outside ranches, the herd has increased to approximately 850, at which level the Park Service wishes to maintain it. Hence the offer of valuable beasts to any one able to provide suitable livings for them and willing to pay for their capture and transportation.

In past years the officials of the Park Service have been much pestered by requests from people who thought that bison bulls could be kept in a suburban back yard, and would make nice pets for the children. These people also thought the animals would be sent free of charge under government frank. To clear up these illusions, the Service has made it plain that these bison are virtually wild animals, even more stupid and ferocious than the bulls of domestic cattle, and that they need to have plenty of space, inside of high and very strong wire fences. They state further that they are unable to give away anything more than just the animals themselves, and that the cost of catching them and bringing them to the railroad at the Park entrance must be borne by the persons receiving them. To this must be added the express charges from the Park entrance to destination, so that a bison is not exactly a cheap gift. Requests for these animals come mostly from city parks, zoological gardens, and similar institutions.

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The regular diet of the king cobra consists of other snakes.

The first typewriting machines wrote only in capital letters.

The algaroba is the most valuable tree in the Hawaiian Islands.

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