

“SPACE EXPLORATION”

EXPLORE MEANS TO TRAVERSE FOR THE PURPOSE OF DISCOVERY

Dictionary.Com

[<http://dictionary.reference.com/browse/explore>]

Explore: 1. to traverse or range over (a region, area, etc.) for the purpose of discover:
to explore the island

EXPLORE MEANS TO INVESTIGATE, STUDY OR ANALYZE

Merriam-Webster Dictionary

[<http://www.merriam-webster.com/dictionary/exploration>]

Explore: 1a. to investigate, study, or analyze : look into <explore the relationship between social class and learning ability>

EXPLORING CAN BE FOR ADVENTURE OR DISCOVERY

Merriam-Webster Dictionary

[<http://www.merriam-webster.com/dictionary/exploration>]

Explore: 2. to travel over (new territory) for adventure or discovery

EXPLORE MEANS TO TRAVEL THROUGH TO LEARN ABOUT

Word Reference.Com

[<http://www.wordreference.com/definition/explore>]

Explore: 1. travel through (an unfamiliar area) in order to learn about it

EXPLORE MEANS TO INVESTIGATE OR DISCUSS IN DETAIL

Word Reference.Com

[<http://www.wordreference.com/definition/explore>]

Explore: 2. investigate or discuss in detail

“SPACE EXPLORATION”

SPACE EXPLORATION MEANS DIRECT HUMAN PRESENCE

MIT Space, Policy and Society Research Group, December 2008

[<http://web.mit.edu/mitsps/MITFutureofHumanSpaceflight.pdf> p.8]

Human presence, and its attendant risk, turns a spaceflight into a story that is compelling to large numbers of people. Exploration also has a moral dimension because it is in effect a cultural conversation on the nature and meaning of human life. Exploration by this definition can only be accomplished by direct human presence and may be deemed worthy of the risk of human life.

EXPLORATION IS A HUMAN ACTIVITY

MIT Space, Policy and Society Research Group, December 2008

[<http://web.mit.edu/mitsps/MITFutureofHumanSpaceflight.pdf> p.8]

Exploration is a human activity, undertaken by certain cultures at certain times for particular reasons. It has components of national interest, scientific research, and technical innovation, but is defined by none of them. We define exploration as an expansion of the realm of human experience, bringing people into new places, situations, and environments, expanding and redefining what it means to be human.

UNMANNED MISSIONS ARE NOT SPACE EXPLORATION

Edward Wright, Teachers in Space, Project Manager, June 28, 2006

[<http://www.spacepolitics.com/2006/06/28/a-move-against-mars-mission-funding/>]

Unmanned missions are not exploration, they are merely reconnaissance. The dictionary defines exploration as “travel for purposes of discovery.” Sitting in a control room looking at pictures of Mars on a TV set is not exploration because it does not involve travel. Calling unmanned space “exploration” and unmanned probes “spaceships” is just an attempt to co-opt the language.

“SPACE EXPLORATION”

SPACE EXPLORATION INCLUDES MANNED AND UNMANNED MISSIONS

Encyclopedia Britannica

[<http://www.britannica.com/EBchecked/topic/557348/space-exploration>]
space exploration, Investigation of the universe beyond Earth’s atmosphere by means of manned and unmanned spacecraft

SPACE EXPLORATION INCLUDES ROBOTIC MISSIONS

Wikipedia, Free Encyclopedia

[http://en.wikipedia.org/wiki/Space_exploration]
Space exploration is the use of astronomy and space technology to explore outer space.[1] Physical exploration of space is conducted both by human spaceflights and by robotic spacecraft. While the observation of objects in space, known as astronomy, predates reliable recorded history, it was the development of large and relatively efficient rockets during the early 20th century that allowed physical space exploration to become a reality. Common rationales for exploring space include advancing scientific research, uniting different nations, ensuring the future survival of humanity and developing military and strategic advantages against other countries. Various criticisms of space exploration are sometimes made.

SPACE EXPLORATION MEANS THE INVESTIGATION OF PHYSICAL CONDITIONS AND CAN BE DONE BY SATELLITES, PROBES AND HUMAN CREWS

The Free Dictionary

[<http://encyclopedia2.thefreedictionary.com/Space+Exploration>]
space exploration, the investigation of physical conditions in space and on stars, planets, and other celestial bodies through the use of artificial satellites (spacecraft that orbit the earth), space probes (spacecraft that pass through the solar system and that may or may not orbit another celestial body), and spacecraft with human crews.

“SPACE EXPLORATION”

SPACE EXPLORATION IS THE EXPANSION OF HUMAN INFLUENCE IN SPACE, WHICH INCLUDES ROBOTS AS OUR PROXIES

G. Ryan Faith, Center for Strategic and International Studies, 2009

[<http://www.thespacereview.com/article/1456/1>]

If we wish to see NASA act effectively as a space exploration agency, then the most direct way to do this is to amend the Space Act to explicitly task the agency with the job of space exploration. However, before we do so, we must define what space exploration actually is. Space exploration is the expansion of human influence in space. This definition of exploration is inherently one of capacity building. Human influence in space is a measure of our ability to do useful things beyond the Earth’s surface. In order to do something useful, there has to be some sort of human presence, either humans themselves or their robotic proxies.

IF SPACE EXPLORATION INCLUDES TELESCOPES IT SHOULD INCLUDE ROBOTS

Andrew MacDonald, Research Scientist, Carnegie Mellon University, 2010

[<http://www.cmu.edu/silicon-valley/files/pdfs/macdonald-alex/brief-history-space-explore.pdf>]

For hundreds of years prior to the Space Age, we explored space through the telescopes of ground-based astronomical observatories. If we consider discoveries made through observations by robotic spacecraft to be space exploration, then we should consider discoveries made through ground-based astronomical observatories to be space exploration as well. In both cases the experience of the human observer is fundamentally the same – that of having vision extended into space through advanced technology. By using a consistent metric to compare the cost of that technology, whether spacecraft or telescope, we can examine the economic history of space exploration in America as a continuum extending from the mid-19th century to the present day and identify long-run trends in funding.

“SPACE EXPLORATION”

HISTORICAL INTERPRETATIONS OF EXPLORATION ARE OUTDATED

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

The word “exploration” threads its way through every discussion of human space flight and often headlines national policy statements about the US space agency. Yet this concept, so rooted in our culture, remains remarkably ill-defined. In this paper, we examine various presumptions implicit in the term and its ramifications for federally supported space endeavors. We argue that historical examples of exploration, widely used by policy makers, often make poor models for contemporary space travel. In particular, historical precedents of exploration set up a land-biased view of discovery, a restriction which impedes full expression of the Vision for Space Exploration and its possible scientific returns. These same precedents also set up a view of discovery that is biased toward in situ human presence, a view that modern technology is rendering increasingly absurd.

HISTORICAL EXAMPLES PROVE HOW HARD TO DEFINE “EXPLORATION” IS

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

The historical record offers a rich set of examples of what we call exploration: Christopher Columbus sailing to the New World, Roald Amundsen driving his dogs towards the South Pole, and Neil Armstrong stepping into the soft dust of the Moon. Yet these examples illustrate the difficulty in pinning down exploration as an activity. If we define exploration as travel through an unfamiliar area in order to learn about it we exclude Columbus, whose discovery was serendipitous rather than purposeful. We would also have to exclude Amundsen and Armstrong, and indeed many of the pantheon of explorers, who tended to dash across new terrain rather than investigate it systematically. Even more expansive terms such as “discovery” sometimes offer a poor fit for the object of modern expeditions: did Robert Peary discover the North Pole in 1909, an axis point that Greek astronomers knew about 2500 years ago? Not in any meaningful sense of the word. Students of exploration, then, must make peace with this uncomfortable fact: “exploration” is a multivalent term, one which has been (and undoubtedly will continue to be) used in different ways by different people. Geographical discovery, scientific investigation, resource extraction, and high-risk travel are activities tucked inside this definitional basket.

“SPACE EXPLORATION”

EXPLORATION MUST INCLUDE HUMAN ADVENTURE, JUST LOOKING, LIKE ASTRONOMY, IS NOT EXPLORATION

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

Yet, for others, humans remain vital to a modern vision of exploration. According to Planetary Society Executive Director Lou Friedman, exploration has to involve risk in distant places. Or, as he puts it, “Exploration” = “Adventure” + “Discovery”. To him, astronomy with telescopes is perhaps not a form of exploration at all.

THERE IS NO ONE DEFINITION OF EXPLORATION

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

First, we should accept that “exploration” is a multivalent term, with many meanings, some of which are contradictory, and all of which have historical precedent. For too long we have looked at the history of exploration selectively, seeking to find the antecedents which justify our own vision of exploration: as science, as human adventure, as geopolitical statement. This is a definitional fight which cannot be won. Space policy must acknowledge the multiple visions for space exploration, developing a clear-eyed metric of value which avoids the vagaries of lofty “exploration-speak”.

ROBOTS ARE AN EXTENSION OF HUMAN SENSES – EXCLUDING THEM FROM ‘EXPLORATION’ IS OBSOLETE

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

While historical precedent defines exploration in terms of human explorers who travel to new destinations, that definition is woefully obsolete with regard to discovery in an era in which teleoperation offers virtual presence for explorers who remain on the surface of the Earth. As has been pointed out by many authors, “robots” have come to be less personal assistants who follow us dutifully, and more expendable extensions of our senses. In this respect, science can be viewed as arguably the most important frontier for humankind, and whether it is done by humans in situ or by humans remotely is no longer a particularly relevant distinction.

“SPACE EXPLORATION”

THE MEANING OF EXPLORATION KEEPS EVOLVING – NOW INCLUDES ROBOTS

Daniel Lester, Dept of Astronomy, University of Texas, 2009

[Space Policy volume 25, number 4, pp. 236-243]

That exploration has deep roots in human history is clear. Yet meanings of exploration continue to change. The models of Apollo, the Space Shuttle and the International Space Station are all conceived in an era before advanced telerobotics and now have limited value in predicting the future course of space exploration. Clearly, we will continue to link space exploration to earlier periods of travel and discovery. Yet we should be careful in what we take away from this record: if history offers stories rich in symbolism, it cannot provide a foundation for contemporary space policy. We now face a vision of exploration that is different from that of our ancestors.

“DEVELOPMENT”

DEVELOPMENT MEANS GROWTH OR ADVANCEMENT

Google Dictionary

[<http://www.google.com/search?q=definition%3A+development>]

development: A specified state of growth or advancement - the wings attain their full development several hours after birth.

DEVELOPMENT MEANS NEW AND REFINED PRODUCTS OR IDEA

Google Dictionary

[<http://www.google.com/search?q=definition%3A+development>]

development: A new and refined product or idea - the latest developments in information technology

DEVELOPMENT MEANS PASSING TO A NEW, MORE ADVANCED STAGE

Google Dictionary

[<http://www.google.com/search?q=definition%3A+development>]

development: a process in which something passes by degrees to a different stage (especially a more advanced or mature stage); "the development of his ideas took many years"; "the evolution of Greek civilization"; "the slow development of her skill as a writer"

DEVELOPMENT MEANS A STATE IN WHICH SOMETHING IS IMPROVING

Google Dictionary

[<http://www.google.com/search?q=definition%3A+development>]

development: a state in which things are improving; the result of developing (as in the early part of a game of chess); "after he saw the latest development he changed his mind and became a supporter"; "in chess you should take care of your development before moving your queen"

“DEVELOPMENT”

CLEANING DEBRIS IS COMMONLY INCLUDED IN PROPERTY DEVELOPMENT

Lawn-N-Order Landscaping

[<http://www.lawn-n-order.net/services.html>]

As property development specialists, we offer a wide variety of landscaping services for the improvement of your home and property. These include: landscaping design & installation, landscape improvement, boulder placement, property maintenance, tree work, lot clearing or cleaning, leaf, brush and debris removal, drainage, patios, walkways, retaining walls, stone works, and grading, water features and handyman services.

DEVELOP MEANS TO EXPAND, STRENGTHEN, IMPROVE THE QUALITY OF

The Free Dictionary

[<http://www.thefreedictionary.com/develop>]

develop

- 2.a. To expand or enlarge: developed a national corporation into a worldwide business.
- b. To aid in the growth of; strengthen: exercises that develop muscles.
- c. To improve the quality of; refine: develops his recipes to perfection; an extra year of study to develop virtuosic technique.

DEVELOP MEANS TO CREATE OR IMPROVE

Business Dictionary.Com

[<http://www.businessdictionary.com/definition/develop.html>]

- 1. To design, create, or improve an object, idea, or other item.

“DEVELOPMENT”

DEVELOP MEANS TO CAUSE TO BECOME MORE COMPLEX, INTRICATE, DETAILED

The Free Dictionary

[<http://www.thefreedictionary.com/develop>]

develop

3a. To cause to become more complex or intricate; add detail and fullness to; elaborate: began with a good premise but developed it without imagination.

DEVELOP MEANS TO CAUSE TO ACQUIRE A SPECIFIC ROLE OR FUNCTION

The Free Dictionary

[<http://www.thefreedictionary.com/develop>]

develop

6. To cause gradually to acquire a specific role, function, or form, as:

a. To influence the behavior of toward a specific end: an investigator who develops witnesses through flattery and intimidation.

b. To cause (a tract of land) to serve a particular purpose: developed the site as a community of condominiums.

c. To make available and effective to fulfill a particular end or need: develop the state's water resources to serve a growing population.

d. To convert or transform: developed the play into a movie.

DEVELOP MEANS TO MAKE USABLE OR SUITABLE FOR COMMERCIAL OR RESIDENTIAL PURPOSES

Merriam-Webster Dictionary

[<http://www.merriam-webster.com/dictionary/develop>]

3a : to make active or promote the growth of <developed his muscles> **b (1)** : to make available or usable <develop natural resources> **(2)** : to make suitable for commercial or residential purposes <develop land>

“MESOSPHERE”

THE MESOSPHERE IS 30-50 MILES HIGH AND ABOVE THE STRATOSPHERE

Windows to the Universe

[<http://www.windows2universe.org/earth/Atmosphere/mesosphere.html>]

The mesosphere is a layer of Earth's atmosphere. The mesosphere is above the stratosphere layer. The layer above the mesosphere is called the thermosphere. The mesosphere starts at 50 km (31 miles) above Earth's surface and goes up to 85 km (53 miles) high.

EXPLANATION OF THE DIFFERENT LAYERS OF SPACE

Jeff Taylor, The Economic Voice, Science Technology and the Environment July 18, 2010

[<http://www.economicvoice.com/earth%E2%80%99s-thermosphere-shrinks/50011816#axzz1RGxkZvfF>]

The Earth's atmosphere is divided into five layers whose heights are constantly changing:

The Troposphere comes first (average up to 11 miles above the surface of the Earth). This is the first layer above the Earth's surface and contains half of the atmosphere. Our weather occurs in this layer.

The Stratosphere comes next (11 to 30 miles above the Earth). It is generally stable and this is the level in which jet aircraft generally fly. It also contains 90% of the Earth's ozone (the 'ozone layer').

Then comes the Mesosphere (30 to 50 miles above the Earth). The Mesosphere starts above the maximum altitude for aircraft but below the minimum altitude for orbiting spacecraft. As information on it can only be gained by sounding rockets it is little understood.

The Thermosphere comes next and is the largest of layers. It can extend out to some 370 miles above the Earth's surface.

Above this is the extremely low density Exosphere where atmosphere and space merge.

“MESOSPHERE”

**ALL SPACE DEBRIS IS BEYOND THE MESOSPHERE BECAUSE OF THE
ATMOSPHERIC DRAG**

Patricia Crews, Earth Science Instructor, Florida – Kent, 2005

[<http://www1.fccj.cc.fl.us/pacrews/atmosphere2.htm>]

The **mesosphere cools with altitude** just like the troposphere (-139° F). **Space debris burns up** in this layer due to friction with the atmosphere.

“BEYOND”

BEYOND MEANS ON THE FAR SIDE OF, PAST

American Heritage Dictionary

[<http://education.yahoo.com/reference/dictionary/entry/beyond>]

beyond

On the far side of; past: Just beyond the fence.

Later than; after: beyond midnight.

To a degree that is past the understanding, reach, or scope of: an evil beyond remedy.

To a degree or amount greater than: rich beyond his wildest dreams.

In addition to: asked for nothing beyond peace and quiet.

BEYOND MEANS FARTHER AWAY THAN OR OUTSIDE OF

MacMillon Dictionary

[<http://www.macmillandictionary.com/dictionary/american/beyond>]

beyond

1 past a place or outside an area

a. farther away than something else

He could see a line of cypress trees and, beyond it, a landscape of red hills.

Traders looked eastward to India and beyond.

b. outside a particular area

By now Dr. Barnard's fame had spread far beyond South Africa.

BEYOND MEANS ON THE OTHER SIDE OF

Encarta

[encarta.msn.com/encnet/features/dictionary/DictionaryResults.aspx?refid=1861590257]

be·yond

CORE MEANING: a grammatical word indicating that something is on the other side of something else, either physically or in the abstract

- (prep) They are expanding environmental protection programs beyond the border area.
- (prep) The gift of laughter is beyond price.

UNITED STATES FEDERAL GOVERNMENT

FEDERAL GOVERNMENT IS THE NATIONAL GOVERNMENT THAT EXPRESSES POWER

Black's Law Dictionary, 8th Edition, June 1, 2004,
[pg.716]

Federal government. 1. A national government that exercises some degree of control over smaller political units that have surrendered some degree of power in exchange for the right to participate in national politics matters – Also termed (in federal states) central government. 2. the U.S. government – Also termed national government. [Cases: United States -1 C.J.S. *United States* - - 2-3]

FEDERAL GOVERNMENT IS CENTRAL GOVERNMENT

Princeton University Worldnet [http://www.dictionary.com/search?q=federal%20government]
Federal government. n: a government with strong central powers.

FEDERAL GOVERNMENT IS IN WASHINGTON, D.C.

WEST'S LEGAL THESAURUS/Dictionary, 1985

[p. 744]

United States: Usually means the federal government centered in Washington, D.C.

FEDERAL MEANS RELATING TO THE NATIONAL GOVERNMENT OF THE UNITED STATES

Black's Law Dictionary, 1999

federal, *adj.* Of or relating to a system of associated governments with a vertical division of governments into national and regional components having different responsibilities; esp., of or relating to the national government of the United States.

INCREASE

INCREASE MEANS TO BECOME OR MAKE GREATER IN SIZE, AMOUNT INTENSITY OR DEGREE

Dictionary.Com

[<http://dictionary.reference.com/browse/increase>] [verb]

increase: to make greater, as in number, size, strength, or quality; augment; add to: to increase taxes.

INCREASE MEANS TO MAKE GREATER

Merriam-Webster Dictionary

[<http://www.merriam-webster.com/dictionary/increase>]

increase: to make greater

INCREASE MEANS TO MAKE GREATER OR LARGER

The Free Dictionary

[<http://www.thefreedictionary.com/increase>]

increase: To make greater or larger

THERE ARE LOTS OF WAYS YOU CAN INCREASE SOMETHING

Brainy Quote.Com

[<http://www.brainyquote.com/words/in/increase177541.html>]

To augment or make greater in bulk, quantity, extent, value, or amount, etc.; to add to; to extend; to lengthen; to enhance; to aggregate; as, to increase one's possessions, influence.

ITS

ITS MEANS POSSESSION

Encarta World English Dictionary, 2009

[<http://encarta.msn.com/encnet/features/dictionary/DictionaryResults.aspx?refid=1861622735>)]

its: indicating possession: used to indicate that something belongs or relates to something • The park changed its policy.

ITS MEANS BELONGING TO SOMETHING PREVIOUSLY MENTIONED

Cambridge Dictionary

[<http://dictionary.cambridge.org/dictionary/british/its>]

its: belonging to or relating to something that has already been mentioned. The dog hurt its paw. Their house has its own swimming pool. The company increased its profits.

ITS MEANS ASSOCIATED WITH

Oxford Dictionaries Online [<http://oxforddictionaries.com/definition/its?view=uk>]

its: possessive determiner, belonging to or associated with a thing previously mentioned or easily identified: turn the camera on its side, he chose the area for its atmosphere

ITS CAN MEAN RELATING TO

Macmillan Dictionary

[<http://www.macmillandictionary.com/dictionary/american/its>]

its: 1 belonging or relating to a thing, idea, place, animal, etc. when it has already been mentioned or when it is obvious which one you are referring to

ITS

ITS MEANS RELATING TO IT OR ITSELF AS A POSSESSOR, AGENT OR OBJECT OF AN ACTION

Merriam-Webster Dictionary

[<http://www.merriam-webster.com/dictionary/its>]

its: : of or relating to it or itself especially as possessor, agent, or object of an action
<going to *its* kennel> <a child proud of *its* first drawings> <*its* final enactment into law>