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Australian Academy of Science

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The Australian Academy of Science has as its aim to spread scientific knowledge, to establish and to maintain scientific standards in Australia, and to recognise outstanding personal contributions to the advancement of science. The Academy, which celebrates its Silver Jubilee in 1979, was set up under Royal Charter by Queen Elizabeth.

Few issues in science in Australia arise without a contribution from the Academy as the only Australian body able to speak for natural science as a whole. While members of the Academy are few, its work touches many segments of Australian society.

Its members, 192 Fellows, are elected for their pre-eminence in science, and include many of those involved in the most exciting scientific developments in Australia. They come from universities, research institutes, industry and the CSIRO.

By its scientific reports on such topics as Supersonic Transport, Use of DDT, Diet and Coronary Heart Disease, Food Additives, Climatic Change, Offshore Resources, Transport, and Effects of Noise, it provides independent information of a high quality to government and the community on problems raised by technology and present-day developments in society. Studies on harnessing solar energy and the feasibility of using icebergs towed from Antarctica to provide fresh water for dry parts of Australia are aimed at contributing to the future development of Australia.

Leaders of science, industry, government and other parts of the community join in the Academy's Science & Industry Forum to explore ways in which science and industry can benefit the nation's development. Hundreds of scientists give their services freely to help achieve the aims of the Academy by contributing to its scientific enquiries, working groups, and in the preparation of its many publications.

Many other scientists have participated in the scientific conferences organised in Australia by the Academy in the past twenty years. School teachers and school children know the Academy for its senior secondary course "Biological Science: The Web of Life", developed and published by the Academy. This is now a standard text which has revolutionised the teaching of biology in all states of Australia.

The Academy is a focal point in Australia for international activity in science. The International Geophysical Year, which, in 1957, saw the launching of the first satellites and the crossing of Antarctica, is one example. The more recent International Biological Programme and the present Global Weather Experiment, a major international collaborative scientific enterprise, which started in December 1978 and which will provide vastly improved understanding of weather systems, follow in the same pattern.

The exchange of visiting groups of scientists from China and Australia, and the start of similar exchange visits with Japan, are among the Academy's other contributions to Australia's role in international science.

The Academy, an independent organisation, receives finances from its own efforts, from private sources, and from Government.

The new moon

Looking somewhat like an Aztec bird, this poster shows mineral textures in a lunar sample returned by the first manned mission to the moon (Apollo 11, July 20, 1969).

The 400 kg of lunar rocks and soils returned to Earth have provided a fascinating insight into the origin, structure and evolution of the moon. The moon stands revealed, not as a ball of shining crystal nor a primeval sample of the solar nebula, but as a small planet, possibly with a unique composition.

The great age of the samples, exceeding 3 and often 4 billion years, also provides a window into the early history of the Solar System. The moon records a complex series of these early events of which the Earth, because of its continuous geological activity, now bears no vestige.

Thus we now know more about the broad outlines of early lunar history than we do about the first billion years of the Earth's history. The moon was formed about 4600 million years ago, close to the date of formation of the Earth and the Solar System. The details of the actual origin of the moon are still a matter of lively scientific debate. Melting of about half the moon shortly after it was formed led to the formation of a 60 km thick light coloured crust (the lunar highlands) and a chemically and mineralogically zoned interior.

During the next stage in the moon's history the crust was repeatedly pulverised and cratered by an intense bombardment of meteorites, asteroids and comets. The craters and basins are of all sizes up to 2000 km in diameter. So although the astronauts could not dig deeply into the lunar surface these impacts had excavated and scattered debris from a considerable depth on to the surface providing us with samples of a great range in age and composition.

As the bombardment declined in intensity about 4 billion years ago, basaltic lava melted in the deep interior, welled up and flowed across the scarred surface to fill the craters and depressions. These dark lava flows are visible as the features of the 'man in the moon'.

About three billion years ago the volcanic activity ceased. Since then the moon has been almost inert. This is in contrast to the Earth where nearly all rocks are younger than 3 billion years; we live on a dynamic, mobile planet which is still actively engaged in mountain building and volcanic activity, sea-floor formation and continental drift.

The rock illustrated in the poster is from one of the dark lunar plains. It flowed out on the lunar surface as lava 3700 million years ago. During cooling, several distinct minerals crystallised, producing the interlocking pattern observed (see key). This photomicrograph was taken with a Zeiss Photomicroscope II in reflected light, using Nomarski interference-contrast equipment. (Original 35 mm transparency image factor 80:1, enlarged 1900:1.)

1 Pyroxene
2 Plagioclase
3 Ilmenite
4 Troilite
5 Cristobalite
6 Aguatechnitlockite

Photomicrograph: Professor J. Lovering, School of Geology, University of Melbourne and G. H. Isenberg, Zeiss Ltd
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