Australian Academy of Science : New Guinea ant, orectognathus velutinus / text: Professor S.C.B. Gascoigne.


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, 150 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 general-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 Orion Nebula

The Orion nebula is one of the best known objects in the sky. It is an immense aggregate of stars, gas and dust, containing about 500 times as much matter as the Sun. Although the Orion nebula is relatively close to us on a cosmic scale (a light takes 1500 years to reach the Earth, and is consequently barely visible to the naked eye. In astronomical terms it is extremely young: 10 million years ago it would have been almost indistinguishable from the Earth, and the bright blue stars around it were would not have been in existence.

The Orion nebula is of particular interest to astronomers because stars are now being born within it. In this process, clouds of gas and dust are forced together partly by their own gravitation and partly by the pressure of other expanding clouds. As the dust and gas clouds contract they become hotter, until the matter at their centres ignites by atomic reactions and they shine as stars. We can detect in the nebula both new-born stars and protostars, the latter, not yet full stars, glow at a dull red heat so that they can be located only by using special infrared detectors.

To the eye the nebula appears white, as all such faint objects do. It can be seen in its true colours only with long exposures on colour film: in this case a 70-minute exposure. This picture was taken with the UK Schmidt telescope at Siding Spring Observatory, NSW. The telescope has a 1.2-metre aperture and is designed for wide-angle photography and hence for sky mapping. In the poster, the four spikes projecting from the brighter stars are an optical effect caused by metal cross-pieces which hold the film in place.

The gaseous component of the nebula is mainly hydrogen. When this gas absorbs energy from the nearby hot blue stars it radiates the energy anew again as visible light in the red part of the spectrum. For this reason the predominant colour of the nebula is red. Other radiations are also present, notably due to oxygen. From studies of the spectra astronomers deduce the temperature, pressure and chemical composition of the nebula.

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