Haskell A. Reich FREE

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matter in the universe. While acceptance of this concept was not immediate, it has come to play a central role in cosmology. He also concluded, from studies primarily with PhD students, that the luminosity at which a change in slope of the luminosity function of a cluster occurs is a universal constant and can thus serve as a standard candle for distance determination.

As recognition of Abell's prominence in cosmological research, he served as president of the Commission on Cosmology of the International Astronomical Union, 1979–1982, and also as president of the Astronomical Society of the Pacific.

Another outgrowth of Abell's intimate familiarity with the *Palomar Sky Survey* was his discovery of a class of "old" planetary nebulae having very low surface brightness. These objects, also known by their "Abell numbers," have central stars that are among the hottest we know. Abell and Peter Goldreich were the first to propose that all planetary nebulae, with their nuclear stars, belong to a normal stage in the evolution of population-II stars within a certain mass range. This concept has also had wide acceptance.

The dissemination of astronomical knowledge was deeply important to Abell. Shortly before his death, Abell had taken over the editorship of the *Astronomical Journal*. He was a gifted, dynamic lecturer who, despite high standards, attracted large numbers of students to the UCLA survey course, "The Nature of the Universe." Very soon after joining the faculty at UCLA, dissatisfied with the pre-World-War-II texts available for the survey course, he wrote the first successful "new generation" text. Abell also served as chairman of the Committee on Education in Astronomy of the American Astronomical Society, participated for many years in the Society's Visiting Lecturer program at smaller colleges throughout the country, and organized and participated in numerous lecture series in the University of California Extension. Particularly dear to Abell was a summer program for gifted high-school science students, which he helped develop and participated in every summer for many years.

Not content to inform people about science on many fronts, Abell became convinced of the importance of publicizing what science is *not*. Shocked by the wide public acceptance of fake science, he insisted that an effort be made to help people think more clearly in general, not just about science, and he became an active worker against pseudo-science. He studied astrology so that he could take on astrologers on their own grounds, including television debates, and wrote many items on pseudo-science.

George Abell was constitutionally unable to remain uninvolved. He was a warm, open, generous human being.

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Haskell A. Reich

Haskell A. Reich, a member of the research staff of the IBM Thomas J. Watson Research Center since 1955, died on 11 October 1983 at the age of 57.

Reich was educated at the Bronx High School of Science, The City College of New York (BS 1949) and Columbia University (PhD 1956). His work at Columbia consisted of atomic-beam studies of the hyperfine spectra of the metastable states of hydrogen and deuterium. These experiments provided accurate results to test further the predictions of quantum electrodynamics.

His interests subsequently turned to low-temperature physics. His experiments on the diffusion of helium atoms in solid helium showed that this diffusion persisted to even the lowest temperatures. This research was important in improving understanding of quantum solids. He then joined the scientific team investigating superconducting computing circuits and during this period became involved in the use of computers in the design, layout and fabrication of complex electrical circuits.

Reich subsequently became an active and enthusiastic protagonist in the work on computer-aided design techniques. He worked closely with development and manufacturing groups to help them to improve their utilization of these techniques. He developed unique programs for the fabrication of special mechanical parts, and he was responsible for a team effort to apply these methods to the instrumentaion and apparatus required for other research projects. His associates will particularly remember his enthusiasm and his dedication to his work.

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Homer E. Newell

Homer E. Newell, who died this past summer at age 68, had a profound impact on the scientific returns from the US space program. It was fortunate for this country that an individual of his ability and understanding helped plan and execute scientific investigation from space from 1947 to 1973.

Newell received his doctorate in physics from Harvard in 1940 and, after teaching at the University of Maryland, joined the Naval Research Laboratory in 1947. The opportunities for space research were expanding in the late forties, thanks to rapid improvements in sounding rockets. These advances led scientists in the International Union of Geodesy and Geophysics to organize an international collaborative effort. This program, started in 1954, was given impetus by focusing on results from a single year, 1957, which became known as the International Geophysical Year (IGY). It was during an IGY meeting in October 1957 that Anatoly Biagonravov stunned the participants by announcing the launching of Sputnik. During this dramatic period, Newell was acting superintendent of the Atmospheric and Astrophysical Division of NRL and a participant in the IGY.

The response to Sputnik was remarkably swift. Congress enacted legislation that established NASA a year later, in 1958, with Keith Glennan as its administrator. Newell transferred from NRL to NASA during the first month of its operations to assume responsibility for its scientific program, a role he maintained until his retirement from NASA in 1973.

Although he assumed additional responsibilities during his 15 years at NASA, his central interest was always the use of space technology for scientific investigation. Soon after James Webb became Administrator, Newell became the director of scientific satellites, and in 1963 he became the associate administrator for space science and applications. From 1967 to 1973, Newell was the associate administrator of NASA. In this final position he worked with all elements in NASA to plan a space program that would encourage and promote national and international scientific investigation. His legacies include communication and meteorological satellites in addition to a wide variety of scientific payloads carried on Earth-orbiting satellites, lunar explorers, and planetary probes and landings. He also played an important advisory role in the scientific achievements derived from manned orbital and lunar flight.

His accomplishments were not limited to the direct return from the space program. His experience at NRL gave him the credibility needed to convince military research leaders of the importance of an "open" space policy. The great surge in our understanding of our space environment could not have occurred without unfettered communication between scientists here and abroad. The routine accessibility of scientific information from NASA's space program is another of his important legacies.

Newell performed heroic service, translating the expectations of the