News of Science

Southern Hemisphere Observatory

Although that part of the sky south of declination −20° (more than 110° from the north celestial pole) comprises only one-third of the total area of the celestial sphere, this region, nevertheless, is one of crucial importance to the astronomer. Within this region may be found the center of our galaxy, most of the inner spiral arms, most of the globular clusters including the three brightest, the great majority of the known cepheid variables, the richest section of the Milky Way, and our two nearest extragalactic neighbors, the Magellanic Clouds. These critical objects are either invisible or at too low an altitude for effective observations to be possible with the comparatively numerous and more powerful telescopes in the Northern Hemisphere. Astronomers have long been accustomed to seeing diagrams connected with Milky Way research in which data for a third of the galactic circle were nonexistent; it is this sort of thing that has been described as "flying with one wing."

Northern galaxies such as the great nebula in Andromeda, for example, have made it possible for California astronomers not only to formulate the observational criteria necessary to establish the distance scale to the outer regions of the observable universe but also to come up with such fertile suggestions as the existence of two stellar population groups. The Magellanic Clouds, however, are at a tenth the distance of the Andromeda nebula; therefore stars in the two Magellanic Clouds appear to be 100 times brighter than stars of comparable candlepower in the Andromeda nebula. The spectra of the brightest, supergiant Magellanic Cloud stars could be studied in great detail, and much fainter stars, similar to our sun, could be studied by direct photography, if only appropriate telescopic power were available in the Southern Hemisphere.

Basic observational data—so necessary to an understanding of the sidereal universe—lag in some fields or are nonexistent in others in the Southern Hemisphere. For example, the number of known radial velocities north of +20° is 3 times as great as for the stars south of −20°. Furthermore, there is no counterpart of the Lick 20-inch astrographic or the Palomar 48-inch Schmidt surveys in the Southern Hemisphere, although there is no question that southern surveys with similar instruments would yield a rich and profitable harvest. Both the 200-inch reflector and the 48-inch Schmidt at Palomar have been used to make decisive observations concerning the identity and nature of the newly discovered strongest radio sources. The new and somewhat spectacular science of radio astronomy not only does not make such telescopes obsolete; it asks questions that can be answered—if at all—only by the best and largest optical telescopes presently available only in the Northern Hemisphere.

The news from below the equator is good, however, and promises that this observational unbalance will be alleviated, in part at least, in the near future. A 74-inch reflector is going through its final testing at the Commonwealth Observatory, Canberra, Australia, and joins the 74-inch Radcliffe reflector at Pretoria, South Africa, as the largest telescope in operation in the Southern Hemisphere. The Union Observatory also has plans for a 74-inch reflector and has already moved some of its observing equipment from Johannesburg, where the industrial smoke, haze, and city lights have become an increasingly serious problem, to a new site on the high veld near Hartebeestpoort Dam 20 miles west of Pretoria.

The Royal Cape Observatory, located 3 miles from the center of Cape Town, is acquiring a 40-inch reflector in 3½ years, which will cost $210,000 and will be located away from the city. This will be the first new major piece of equipment in more than 50 years for this observatory, which was founded by the British Admiralty in the 1820's. The Royal Cape Observatory has had a long and active history in the field of stellar astrometry and in more recent years has pioneered in the increasingly important field of precision stellar photometry.

The Boyden station at Harvard Kopje near Bloemfontein, Orange Free State, has recently come under the joint control of six observatories—namely, Harvard Observatory; Armagh Observatory, North Ireland; Dunsink Observatory, Eire; Hamburg Observatory, West Germany; Stockholm Observatory, Sweden; and Uccle Observatory, Belgium. The two main telescopes at Harvard Kopje are the 60-inch Rockefeller reflector and the 32-inch Baker-Schmidt telescope. The site is undoubtedly a good one, free of city smoke and lights, with winter observing conditions especially fine.

Despite all this evidence of southern hemispheric activity, none of the aforementioned telescopes matches the power of the three California reflectors, the 200-inch Hale telescope at Palomar, the 120-inch at Lick, and the 100-inch Mount Wilson reflector. Provisional plans have been announced, however, for a Joint European Southern Observatory, which will include a 120-inch reflector, a 48-inch Schmidt telescope like that on Palomar, and possibly a meridian circle. Such an observatory would have three main functions: (i) to help fill in the extensive gaps in our basic observational data; (ii) to provide first-class observing facilities for experienced astronomers who live in poor climates and who lack proper equipment; (iii) to take fuller advantage of the most unusual observing opportunities provided by the southern third of the sky. The observatory would cost $4.5 million, and the following six countries have taken part in the preliminary discussions: Belgium, France, Great Britain, Holland, Sweden and West Germany. An expedition of four European astronomers is now in South Africa investigating sites on the high veld and in the Karroo. Extensive and lengthy site-testing is necessary for such a large telescope, which becomes ineffective at times of poor seeing. The telescope should be located far from a population center in an atmosphere both stable and transparent a large part of the time. A similar site-testing program, sponsored by the National Science Foundation, is now studying possible sites in the southwestern United States in connection with the proposed new National Astronomical Observatory.

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Need for Patent Examiners

American industry is facing long delays in obtaining patent coverage for products and processes that are otherwise ready for the market, according to reports made at a recent meeting of the New York Patent Law Association, which was addressed by the Commissioner of Patents.

These delays stem from the great increase in the number of patent applications filed during the past few years. The flood of inventions has stretched