the full institute at its second annual meeting in November, is a radical departure from the NAS's usual way of doing business. Kessner and his colleagues did not just "study" health delivery systems from the safe confines of their IOM offices. They went out into the community, examined patients and, in some cases, actually delivered care themselves. Traditionally, the NAS and its various related groups do not do research in any direct way. Decisions and recommendations are based on literature reviews and the collective experience of the members of any given panel or committee. Kessner believes this approach will prove inadequate to health policy issues.

Kessner's attitude toward health policy research is somewhat like Schwartz's. "There are some questions that simply cannot be answered by asking 'what ten wise men think,' " he states. The relative quality of various health care delivery systems is, he says, among those questions. For the last 3½ years, Kessner and a team of physicians and assistants have spent about $1.4 million (about 65 percent of it from the Carnegie Corporation of New York) assessing quality. They think they have created a valid model for such studies and demonstrated that it should be widely used.

Kessner and company picked three diseases common to childhood, a series of health delivery systems, and a population of children and then tried to evaluate which system gave the children the best care. The diseases were iron deficiency anemia, middle ear infections, and visual disorders; the delivery systems included solo practitioners, small group practices, prepaid group practices, public clinics, and hospital emergency rooms.

The IOM group established what it considered a floor or baseline of acceptable care (and screening) for the three diseases, identified 1700 families with 2600 children who were using one of these health delivery systems, and then set up a clinic at Children's Hospital in Washington, D.C., where they examined each of the children themselves. "We believed," Kessner says, "that we could not evaluate the care these kids were getting by merely reviewing medical records. So, we did our own field work."

The data they accumulated in this study are now being analyzed by computer and, as yet, there is no solid basis for declaring one delivery system superior to another. Nevertheless, one member of the study staff speculated that it would show that solo practitioners give better care than many persons like to admit in this time of emerging group practices and large-scale delivery systems. In any case, the results of this study, and of others like it should they be undertaken, will have important implications for the assessment of the quality of health maintenance organizations and other major federal health programs.

"We hope to speak to the critical issue of evaluation so that it can be built into systems for delivering health care," Kessner says. "And we hope to have something to say about whether it is possible to build into health programs a process for accountibility."

—BARBARA J. CULLITON

Astronomy at Cambridge: Reshuffle Not According to Hoyle

London. Murder in the dark is a popular English children's game in which the lights are turned off and everyone creeps around expectantly until the victim's screams announce that the murderer has struck. As often as not, there is a chance encounter in the dark and a player may cry murder when none was intended. It is not clear which of these two outcomes has occurred in the adult version of this game now in progress among English astronomers. There the darkness is provided in roughly equal measure by the arcane system of governance of the University of Cambridge and the dogged commitment to secrecy of the Science Research Council (SRC), the English counterpart of the National Science Foundation. The victim is the distinguished theoretical astronomer, Sir Fred Hoyle, who a month ago announced his resignation as Plumian Professor of Astronomy and Experimental Philosophy, a chair from which he also presided over the Institute of Theoretical Astronomy (IOTA) at Cambridge. Hoyle's supporters have not concealed their suspicions that Hoyle has been done down by the manipulations of his academic opponents. Cambridge University officials, on the other hand, insist that everything has been aboveboard and that Hoyle resigned unnecessarily because of a misunderstanding that he neglected to correct.

Hoyle is best known to astronomers for his work on cosmological questions such as nucleosynthesis and the steady-state hypothesis, and to the public at large for such professional *jeux d'esprit* as *The Black Cloud*, an excellent foray into science fiction. The institute he has built up at Cambridge since 1967 may not have discovered the secret of the universe, but it has already acquired a solid reputation, although less, some murmur, than was at one time hoped for. Under Hoyle's leadership, IOTA has also become an international meeting place, its summer schools performing the same function for astronomy that the Woods Hole seminars do for molecular biology. Hoyle's resignation will probably, in due course, bring him to the United States, where he is a frequent and well-known visitor. His impending departure is viewed by some of his colleagues as a heavy blow for British astronomy, and by others as a blow that British astronomy will survive.

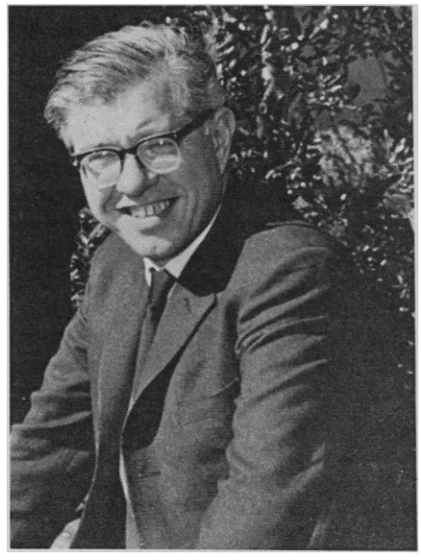
The immediate circumstance of Hoyle's resigination was a plane ride last February to Australia, during which he sat next to the director of the SRC's astronomy division, James Hosie. Talking of the plans to amalgamate IOTA with the Cambridge Observatories into a new Institute of Astronomy, Hoyle realized for the first time that the director of the new institute was to be not himself but the recently elected chief of the observatories Donald Lynden-Bell, a theoretical astronomer at Sussex University. Hosie said he understood that Hoyle had turned down the post of director. In fact, Hoyle had never been consulted about it. Arriving in Australia, Hoyle

wrote resigning his chair and with it the directorship of IOTA.

This, at least, is the version of events given in the London *Sunday Times* last month. It was quickly disputed by university officials, who made known that the director of the new institute has not yet been chosen. But for Hoyle's unfortunate resignation, these officials indicate, he would almost certainly have been appointed director of the new institute. It is hard to see how Hoyle could have misunderstood Hosie, yet it is equally unclear how Hosie could have known who the new director would be if the appointment had indeed not been agreed upon by those who arrange such matters. Hosie declined last week to comment, and Hoyle was unavailable; Hoyle was presumably the source of the *Sunday Times*'s account of the conversation.

The Hoyle-Hosie conversation was only the last in a series of events that both sides interpret differently. Hoyle's institute was set up in 1967 after veiled hints that Hoyle might otherwise brain-drain to the United States (*Science*, 15 September 1967). IOTA also served as a handsome consolation prize after the decision by Cambridge University to expand its radioastronomy activities under Hoyle's colleague and rival Sir Martin Ryle. The university thus found itself supporting three administratively separate branches of astronomy—radioastronomy under Ryle, theory under Hoyle, and a department of observational astronomy, an important part of which is located in a mock medieval castle in Malta. A university committee set up to rationalize this state of affairs advised last year that the observational and theoretical astronomers should be amalgamated, with the vague intent of bringing in the radioastronomers at some future date. Absent from the practical reasons given for omitting the radioastronomers from this unification is the personal relationship between Hoyle and Ryle, which is rumored to be about a few degrees above absolute zero.

The terms of the proposed merger were unfavorable to Hoyle; they reduced the freedom of his institute from university control and stipulated that the directorship of the combined institute should rotate each 5 years between himself and the head of the observatories. A further twist of the knife was the recommendation that radioastronomy get the highest priority from the university in the future. Although Hoyle may not have welcomed these



Sir Fred Hoyle

proposals, he was a member of the committee that drew them up, and he signed without printed reservations the committee's report (*Cambridge University Reporter*, 4 October 1971, p. 85).

Hoyle also swallowed a further defeat in the appointment of a successor to R. O. Redman, retiring professor of astrophysics and head of the observatories. The committee that recommended the merger urged, not unreasonably, that the chair should be filled by "an Astrophysicist with a strong interest in fostering instrumental development." Hence it was surprising when, precisely 12 months after the committee's directive, an eminent theoretical astronomer, in the person of Lynden-Bell, was elected to the professorship. With engaging modesty, the future castellan of the baronial observatory in Malta stated on his election that his experience of practical astronomy was "completely negligible."

In terms of simplicity, the manner in which Cambridge University elects itself a professor of astrophysics differs from selection of the Holy Roman Emperor chiefly in that the Holy Roman Empire had seven electors and the chair of astrophysics has eight. The eight astrophysical electors are confirmed in office by three different university bodies, but how they come to be proposed in the first place is a mystery known only to those who arrange such matters. Partisans of Hoyle find significance in the fact that, during the 9 months before the election board was called together, an influential ally of Hoyle's, Sir Bernard Lovell, rotated off the board, which, by the time it did meet, included three present and one past member of the Cavendish laboratory, to which Ryle's group is attached. The suggestion that the meeting of the electors was deliberately delayed was described as a "disgusting slight" by a university official, who told *Science* that strenuous efforts had been made to call the board together before Lovell rotated off.

When the board met last November, the decision went 7 to 1 against Hoyle in favor of electing Lynden-Bell. Hoyle had no personal objection to Lynden-Bell, but believed an observational astronomer was required, his own candidate being Wallace Sargent of Caltech. Nevertheless, Hoyle accepted the election and sat down with Lynden-Bell to compose a grant application to the SRC for the combined institute. The impression later given by the SRC's Hosie that Lynden-Bell would be the first director of the institute was for Hoyle only the final straw on a pile of unpalatable decisions.

While Hoyle's partisans indicate to the press that the whole matter is a devious conspiracy, others point out that Hoyle was consulted at each stage of the process and signed the reorganization plans drawn up by the university committee. As for the rumor heard from Hosie, Hoyle had only to check it to discover its falsity, university officials say. One reason why the official version has not commanded more enthusiastic acceptance is the clandestine nature of the procedures adopted by the university and the SRC. Since the SRC is to pay much of the bill for the new institute, it would certainly have been consulted on the choice of a new director and the criteria for choosing a new astrophysics professor. Nor is Cambridge University very likely to reorganize its astronomy facilities without reference to the top-secret master plan for Northern Hemisphere astronomy that has been drawn up by the SRC. Despite which, SRC officials refused point-blank to discuss any aspect of the affair, claiming that it is "entirely a university matter." This evasive attitude on a matter of evident public interest and importance does little to dispel the impression of guilt. Officials of both the university and the SRC are thus caught in the quite possibly misleading position of maintaining a cloak around their actions while the Hoyle camp is out yelling about the dagger in their champion's back.

—NICHOLAS WADE