In the concluding paragraph of his Nobel Symposium talk (reproduced by you) he says, 'I have been dead since the early 1960s. . . .' But why? The reason, I feel, was that during that period he had the idea — to put in words as he often spoke to me —: 'Cholera is a dying disease; my work will be a museum piece in my life-time itself! The future holds only in the development of a stable vaccine'. He started working for it in his own ways but met with repeated failures. Alas, after 30 years success still eludesus, as pointed out by R. A. Finkelstein (p. 661). It was indeed a tragic experience to see him moving from pillar to post even for a small gadget. A deep freezer donated by the Australian government through the good office of Sir Roy Cameron simply could not be released from the Customs before it turned to junk. There are many such examples. It was indeed painful to watch the pangs and anguish of a great scientist of De's calibre being forced to abandon his work at a point from where he could have gone a much longer way. He sang his swan-song in the concluding words of his Nobel Symposium talk: 'I discontinued my work on cholera enterotoxin as soon as I felt that with the limited resources and technology at my disposal, it would be impossible for me to pursue it further as I desired'.

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NEWS

Indian astronomers make solar observations from Antarctica

A team of astronomers from the Indian Institute of Astrophysics in Bangalore and the Uttar Pradesh State Observatory in Nainital set up a solar telescope at Maitri, India's permanent base on Antarctica. Three of the scientists, who were part of the ninth Indian Antarctic expedition, used the telescope between December 1989 and March 1990—the Antarctic summer to study convection processes in the solar photosphere.

Some of the challenging problems in solar research of current interest are solar convection, organization of magnetic fields on the Sun, and oscillations on the solar surface. The prime requisite in all attempts at understanding these phenomena is continuous observation of the Sun without interruption due to the day and night cycle, which, in principle, can be overcome by setting up a world-wide network of observing stations. Such an effort was made during the International Geophysical Year (July 1957 through December 1958). Another way is to travel to the Arctic or the Antarctic regions during local summer, from where one can see the midnight sun and make observations without interruptions, provided good weather prevails. The first observations of this kind were made in 1966 from Thule, Greenland, US scientists.

Oscillations of the solar surface are the result of sound waves resonating in the interior. Solar physicists probe the interior of the Sun by observing these oscillations much the same way as seismologists use seismic waves to learn about the Earth's interior, and by analogy this branch of study is known as helioseismology. The numerous modes in which these oscillations occur can be brought out only by realizing a high resolution in the frequency domain and this is possible only by acquiring a sufficiently long and uninterrupted chain of data.

Another phenomenon, namely convection, occurs in the solar photosphere on many scales of time and size. One of them is the convective flow giving rise to supergranulation. The convection cells discovered in 1959 by Leighton *et al.* at the Mt Wilson Observatory in dopplergrams of the Sun's surface, have an average dimension of 25,000 km and lifetimes in the range of 20–22 hours. The lifetime is an important parameter in the study of the evolution and decay of these convection cells for an understanding of their dynamics. At the photospheric level, these cells are seen only in the dopplergrams. An easier way is to observe their counterparts at the chromospheric level, where they can be seen conspicuously in the monochromatic photographs of the Sun in any of the typical spectral lines of chromospheric origin, like, for example, the K line of ionized calcium at 3933.684 A. A photograph of the Sun taken with a sufficiently narrow band pass filter centred on the K line shows a network pattern all over the solar surface, which bears a one-to-one correspondence with the supergranulation cells. This correspondence makes the experimental set-up required to view and study these cells far easier than viewing them through dopplergrams. An uninterrupted sequence of monochromatic pictures of the Sun (also called filtergrams) in the K line can be used to study the temporal features of the convection cells. In addition, the data acquired would con-

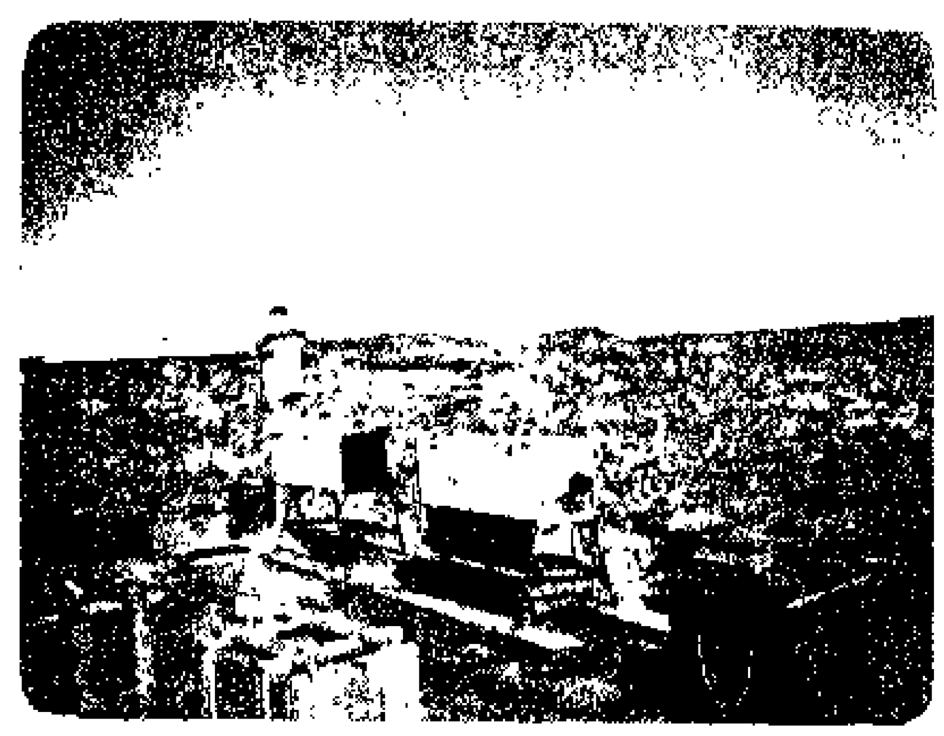

Figure 1. The solar telescope installed at Maitri, Antarctica. The Maitri station and polar ice seen in the background are to the south.