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smooth surface, was an unlikely candidate for volcanism. Almost devoid of craters (no surface feature is higher than 50 m), the moon displays numerous fine cracks, some of them reaching halfway around its globe. Pre-Voyager analysis had already indicated that the moon's surface was water ice, covering a dense rocky core.

Cook, a member of the Voyager imaging team, theorizes that the ice we see is, in fact, a sheet a few kilometres thick overlying a 5-kmdeep global sea. Massive tides, driven by the parent world and its two large Galilean neighbours, erode the bottom of the ice. The cracks are weak spots which let the water escape thorugh vents as vapour and crystals, leaving it frost covered. The ice may well contain ammonium hydroxide, which would make it rather soft so that craters formed by meteoroids would flatten out with time and be frosted over. The cause of the plume is then deemed to be crystals from an unusually large vent.

The presence of water on Europa has generated a controversy among biologists, and it was anticipated in Arthur C. Clarke's latest novel, 2010: odyssey two. Clarke hypothesized that plant forms exist under the ice where its surface is exposed to sunlight. Detailed analysis of the satellite and the composition of the plumes (if more are found) will have to await the arrival of the probe Galileo in 1988.



Dashing through the snow

The restrictions imposed on the handicapped by the Canadian climate have been partly overcome by a new wheelchair design. Everest and Jennings Canadian Ltd., of Concord, Ontario, are manufacturing a selfpropelled chair originally developed at the Ontario Crippled Children's Centre (OCCC). With support from NRC's Industrial Research Assistance Program, the company completed the design proposal and is now producing the wheelchairs. According to company spokesmen, exports to Europe and the United States appear likely.

Security, comfort, and control are the chief elements in the new device, dubbed the "OC³ Flyer" due to its origins. The "Flyer" utilizes a new drive system, enabling it to contend with snow, mud, and even gravel, which normally impede wheelchair operation. Direction and speed control are provided by a "joystick" mechanism requiring minimum hand strength capability. The joystick is coupled to a feedback system that brings the chair to a smooth stop should the user release or lose his or her grip on the control. User comfort, an important consideration given the number of hours per day the chair is likely to be in use, is enhanced by a newly designed suspension system. Incorporated in the design are four seating methods, adaptable to a wide spectrum of users. With electronic control of the drive, the jerky starts and stops characteristic of earlier self-propelled designs have been eliminated.

The Everest and Jennings development of the chair introduces a new research capability in Canada. Before now, wheelchair designs were primarily imported. From this start, the firm is already working on an improved control system for cerebral palsy victims, and on other children's mobility aids.