

**M**OST of the progress that has been achieved so far in shaking man free from the dusty ground of earth has been rooted in the development of machinery and techniques that would make it possible to adapt the alien environment of space to the human mind and body (and, perhaps, soul?). Recently, however, scientists proposed the revolutionary opposite: adapting the human being to the environment. He would then, in the words of Dr. Manfred Clynes and Dr. Nathan Kline, become a "cyborg"—a "man-machine in which the control mechanisms of the human portion are modified externally by drugs or regulatory devices so that the being can live in an environment different from the normal one." ("Cyborg" is a word compounded of "cybernetics," the science of information control, and "organism.")



## **EDITORIAL**

The cyborg would be something more than human—or, if you are philosophically inclined, perhaps something less than human. Eating, breathing and other functions would be automatically handled by drugs and machines, many of which would be directly built into the organism's flesh. Some of you may be familiar with sf stories about the men who "terra-formed" alien planets. Our scientists are going a step better: they are "space-forming" human beings.

How would the adaptation to a hostile environment be accomplished? Here are some things the two scientists suggested:

- replacing the blood's oxygen with carbon dioxide by rigging a "solar-powered lung" to a man's arteries. This would do away with the need for breathing.
- processing body wastes to extract their nutrients, and then recycling this material back into the carbon-dioxide bloodstream. This would do away with the need for eating.
- injecting, automatically by osmotic pumps or similar devices, drugs that would induce cold sleep for the long journeys across interstellar distances. The injection device could be surgically incorporated in the cyborg's body.
- automatically heating the brain to enable it to maintain full function during hibernation.
- implanting devices to measure and react against dangerous

*(continued on page 107)*