

Charging the brain

Strong electric currents, forced through the skull, boggle and confuse the mind, and produce convulsions and coma as well as temporary relief from severe mental illness.

Milder electric currents may have another kind of beneficial effect.

For the most part, U.S. scientists haven't been too interested in the effects of mild currents on the whole brain, preferring to work with tiny brain sections. Scientists in the Soviet Union, however, and a few fringe practitioners in the United States, for several years have been using mild currents on patients. They claim the currents can cure such psychosomatic and emotional ills as high blood pressure, ulcers, anxiety, stuttering and bedwetting.

The Soviet Union now has some 300 clinics giving electrical treatment. The practice is reportedly growing in both the U.S.S.R. and Eastern Europe.

To take a broader look Marquette University late last month called a conference on the physiological effects of diffuse electric currents. The invited Russians didn't show up. But the U.S. fringe did, and by the conference's third day, the many top scientists present were well aware they were in for some strange reports.

They heard one participant talk of curing cancer with magnetic fields and listened to another describe results with an electrosleep machine.

"You get the feeling," Dr. Saul Aronow, an engineer at the Massachusetts General Hospital says, "that if you push a little, some of these people will probably start talking about ESP."

But the conference served several useful ends. It focused scientific interest on a neglected area and brought to light whatever scant evidence exists on electrosleep and electroanesthesia. Perhaps most important, the meeting brought together neurologists, physiologists, engineers and anatomists, all working in the combined field of neurology and electricity. Midway through the conference, they joined to form a new society, tentatively titled the Neuro-Electric Society—which should screen out quackery.

"When you strip away all the hocus-pocus," Dr. Aronow points out, "there is something worth looking at."

A mild electric current, for instance, in the range of a few milliamperes, does alter human mood and could possibly be therapeutic. Electroanesthesia has worked on animals and may someday be useful in surgery.

The word electrosleep refers to therapy with low steady currents and is a misnomer. It comes from the term the

Russians use, "electrosone," apparently derived from a misleading French word, but neither the Russians nor other practitioners believe sleep has anything to do with the therapy. Some patients happen to fall asleep during a half-hour treatment, but that is incidental, say the Russians.

Dr. Aronow agrees. He was the only conference participant to report experiments with what conferees persisted in calling electrosleep. Dr. Aronow says a direct current of 1.5 milliamperes flowing through the head will depress or elevate mood. None of his 47 subjects could feel the current, but two-thirds of them showed gross changes in emotional behavior.

A negative electrode on the forehead generally elevated mood, making the subjects talkative, often giddy and more interested in things going on around them. The current worked particularly well on depressed patients, says Dr. Aronow, all but one of whom responded. Some of the 47 subjects, however, were terminal cancer patients, and fewer of these responded with mood changes, perhaps because the negative forehead electrode made their pain worse.

A positive forehead electrode usually depressed emotions and made the patients withdrawn and moody. There were a few patients, however, who reacted in the opposite way and improved with a positive charge from the forehead. These were the anxious, excitable patients.

With that exception, says Dr. Aronow, "it looks as if the negative-positive order is the way to enhance elevation of feeling."

He says the true neurological effect may not be primarily electrical. The current could be stimulating brain blood flow, or it might be affecting chemicals in the brain. A third alternative is that the current changes the electrical bias of the brain slightly.

The Massachusetts experiment was exploratory and far from conclusive, Dr. Aronow cautions, but it does lend some support to Russian claims that they are getting an effect with the electro-sone machine—claims which American researchers cannot quite endorse, but are unprepared to reject. ♦

THE WEEK IN SPACE

Soviet and U.S. activity

The recent flurry of space activity from the Soviet Union has had observers betting that a new Russian space feat is likely in the very near future. A multi-manned earth-orbiting flight is still one possibility, despite the denials by Soviet officials that any such effort

was planned to mark the 50th anniversary of the Russian revolution Nov. 7. Another possibility is an unmanned flight around the moon and back.

Evidence for some major impending event includes the launch of six Cosmos satellites in as many days. Past clusters of Cosmos launches have often preceded manned Soviet space flights. At least one of the latest group—Cosmos 186, launched Oct. 27—appeared to be an unmanned duplicate of the Soyuz 1 spacecraft in which Cosmonaut Vladimir Komarov was killed last April. More than 12 Cosmos flights since that time have had orbital characteristics indicating Soyuz-type craft.

In addition, Cosmos 188, launched Oct. 30, carried out automatic docking procedures with Cosmos 186, joining it in space and staying coupled to it for most of a day. The two spacecraft then separated, and while Cosmos 188 stayed in orbit, the Russians reported that 186 came back down to a "soft landing in the pre-set area."

The U.S. has also been very busy in space. Center of attention is the giant Saturn 5 booster that was set to carry an Apollo spacecraft on an unmanned practice flight.

The Mariner 4 spacecraft, which photographed Mars in 1965 as it flew close by the planet, played back some of its pictures for scientists at the Jet Propulsion Laboratory recently, demonstrating that such images could be stored in space for long periods of time.

Scientists at North Carolina State University announced last week that wasps that orbited the earth 30 times in Biosatellite 2 last September showed genetic damage as a result of radiation. The adult female wasps lived longer and produced more eggs than those in a normal control group, the researchers reported, but study of egg embryos showed "radiation-induced damage severe enough to cause death at specific stages of development."

And more U.S. space action was yet to come. Scheduled for launch last week and this were:

- The third Applications Technology Satellite (ATS-3) equipped to take full-color high-resolution weather photos of earth and to try out new satellite communications and navigation techniques;

- The sixth Surveyor soft-landing lunar robot intended to dig holes in and make chemical analyses of the moon's surface while photographing itself;

- The first flight of the Saturn 5 super-booster (see p. 472) whose successor will send three men to the moon;

- The fourth member of the Tiers Operational Satellite System (TOSS-D), a weather-watching satellite that will be taken over by the Environmental Science Services Administration as ESSA-6 once it is in orbit. ♦