turn of animal manures and harvest residues to the soil. But plant needs for phosphorus and potassium must also be met and any organic farming regimen that excludes additions of these minerals other than by recycling manures will often amount to "mining" the soil of these essential nutrients. Whether in an intensive organic system enough phosphorus and potassium for good plant growth will be released from natural rock phosphate and potash (sources of low solubility) is said to be an as yet unanswered question. The potential for making up nutrient deficits by drawing on off-farm sources of organic wastes is limited because most animal manure and crop residues are being returned to the soil already.

• *Energy needs*. Studies comparing the energy requirements of organic and conventional farmers for the growing of barley and three varieties of wheat found net energy savings of from 15 to 47 percent for the organic farmers; except in the case of winter wheat, the organic farmers used more fuel but this was more than offset by the fact that they used no inorganic fertilizers.

• *Crop yields*. The study team found that comparing yields of organic and conventional farmers is difficult and controversial because short-term studies may not reliably indicate long-term performance. Whether the organic farmers' yields are superior or inferior to the conventional farmers' appears to vary by crop and by region.

• *Economics*. Most organic farmers believe that their net farm income is no higher than that of conventional farmers and may be lower; but they believe their indebtedness to be less. The possibilities for a shift from conventional to organic farming is said to be limited in some areas by climate, lack of adequate supplies of organic wastes, or other factors, such as soils poor in phosphorus and potassium.

Modeling studies cited in the report show that, if a total shift to organic farming were somehow to occur, domestic food needs would be met but farm exports would fall short of their potential. Grain prices and farm income would be higher, and so would the prices paid by consumers.

"Based on our observations," the study team said, "the greatest opportunity for organic farming will probably be on small farms and on larger mixed crop/livestock farms with large numbers of animal units."

Making the transition from conventional to organic farming often demands of the farmer the patience and wherewithal to put up with several years of poor crops, the report points out. Investigation of soil management problems inherent in the transition is seen as another of organic farming's important research needs.

For some time now, Secretary Bergland has been tilting in favor of basic as opposed to applied research and has drawn criticism in agribusiness circles for saying the USDA has no business to support development of new fruit pickers or other farm machines. In his view, the organic farming report further points up the need to focus on basic scientific questions related to soil management and crop productivity.

In light of the report, Bertrand, director of SEA, says that given the tight budgetary situation the department cannot expect to receive new money for such research but that he foresees "some reorientation of existing resources." An organic farming coordinator for SEA already has been hired, with the job going to Garth Youngberg, a political scientist from Southeast Missouri State University who served on the study team.

What is an organic farmer? How many are there?

At a meeting on 5 May at the University of Massachusetts, Youngberg, Papendick, and others associated with the study presented the report's major findings before some 140 New Englanders from extension programs, experiment stations, the state universities, and state departments of agriculture. The message appears to have been well received. "I think all of us agreed that we ought to be looking into this subject," says Frederic Winthrop, commissioner of agriculture for Massachusetts.

Similar meetings may be held this fall in the Northwest, California, and the Midwest. Interest in the report is high, as indicated by the hundreds of inquiries about it already received. Farmers tend to be set in their ways, but when there is as much trouble down on the farm as there is today, they can be amenable to change. Many may soon be taking a look at organic farming practices that can perhaps ease some of their problems, such as loss of topsoil to erosion and loss of income to escalating fertilizer costs.

—LUTHER J. CARTER

Arguments Heard for Psychedelics Probe

A Harvard psychiatrist is conducting what appears to be a one-man crusade to stimulate renewed scientific interest in psychedelic drugs. Lester Grinspoon, author with James Bakalar of the recent book *Psychedelic Drugs Reconsidered*, believes that such research with humans "did not die a natural death because of loss of interest," but became taboo because of the bad reputation won through abuse of the drugs in the 1960's.

The history of clinical research with psychedelics goes back to the 1930's, when Heinrich Kluver, psychobiologist at the University of Chicago, tried psychedelics as a complement to therapy in various psychiatric disorders. Much clinical research went on in the 1950's and early 1960's, when the drugs were tried on drug and alcohol addicts, prisoners, and dying cancer patients. But research dwindled as the drugs became widely abused, and in 1970 the Food and Drug Administration added them to schedule I, the category of the most tightly controlled substances.

Now, although there is continued extensive abuse of psychedelics, Grinspoon believes the climate is right to take another look at the drugs. He contends that they could shed much light on such areas as brain lateralization, altered states of consciousness, and the search for receptor sites in the brain. And, he says, as therapy "they are really crying for more attention." Grinspoon acknowledges that "controlled studies are not that impressive," but believes there is enough anecdotal evidence to justify further explorations. Single doses of LSD, given to alcoholics or drug addicts, for example, have induced in some deep experiences, akin to religious conversions, that have afforded them a new vision of their lives and enabled them to shake their habits. Grinspoon also says "psycholytic" therapy—the administration of psychedelic drugs in conjunction with psychotherapy—needs further exploration. "If, as Freud said, dreams are the royal road to the unconscious, is it possible that psychedelic drugs are a superhighway to the unconscious?"

Among the few researchers now in-

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terested in the subject is Albert Kurland, psychiatrist and clinical psychopharmacologist at the Maryland Psychiatric Research Center. The center administered LSD to some 500 persons—addicts, prisoners, psychiatric patients, and terminal-cancer patients—until the late 1960's, when the state legislature told them to stop using it. Kurland says that about one-third of the subjects underwent dramatic "peak experiences" that significantly affected their lives. Many of the 100 cancer patients treated, for example, experienced an improvement in emotional state and an accompanying reduction in pain, which lasted up to several months after one treatment. Kurland was planning to see if LSD would be helpful in conjunction with psychotherapy for schizophrenic patients, but this project was scotched by the state ban.

Kurland currently holds what he believes to be the only clinical IND (investigative new drug permit) for LSD, and recently began a new project (with his own money) administering LSD to selected cancer patients in a Baltimore hospital. But he believes the drug has "tremendous therapeutic potential" as an adjunct to psychotherapy for depression, schizophrenia, and personality disorders. While other, noninvasive methods—kundalini yoga, for example, or sensory deprivation—can lead to peak experiences, Kurland says the former requires too much psychological discipline on the part of the patient and the latter can be frightening and disturbing. "Drugs are just much more effective."

The scientific establishment is generally unsympathetic to the arguments for psychedelics. Daniel X. Freedman of the University of Chicago, who has done research in the neurochemistry of LSD since 1957, says that "no salient new intellectual questions are being asked that urgently warrant human research." He says the lack of such research is not simply the result of the "bureaucratic cloud" hanging over the drugs but a reflection of a dearth of sound proposals. Furthermore, he believes much more animal work could be done on the neurobiology of psychedelics before extensive new human work is justified.

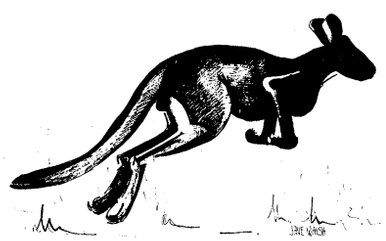
Psychiatrist Robert Dupont, a former head of the National Institute on Drug Abuse, concurs. Dupont says that, by and large, it is not the researchers who are asking for liberalization of rules pertaining to abusable drugs; rather it is "drug radicals" who are using possible medical and scientific applications as a "stalking-horse or Trojan horse" for their cause. "It is not obvious that anybody is suffering from a deficiency of LSD in this country," remarks Dupont. In recent years there have been a number of moves to promote a new look at drugs hitherto known only for their abuse potential. Some people want heroin made available for treatment of cancer pain. Psychiatrist and mind-researcher Andrew Weil has proposed the inclusion of cocaine in a number of licit products. And there has been great pressure on the government to make marihuana available for treatment of glaucoma and the adverse effects of chemotherapy. An FDA advisory panel recently voted, by a narrow margin, in favor of easing restrictions on the use of synthetic pills containing THC, the active ingredient of marihuana, to alleviate nausea from chemotherapy.

'Roos Abundant, Imports O.K. Says U.S.

Despite the objections of some conservation organizations here and in Australia, the government has proposed lifting a 5-year ban on the import of kangaroo products.

Kangaroos were listed as a "threatened" species under the Endangered Species Act in 1975, and Australia was told that the ban would be reconsidered after Australia had demonstrated that its kangaroos were thriving and that it had developed sound plans for the management and shooting of its national symbol. The Office of Endangered Species of the Interior Department now professes itself satisfied with the situation. Some wildlife groups are upset, however, because they say no accurate count of kangaroos has been made, that no one really knows what would constitute a sustained yield, that management plans have not curtailed illegal shooting, and that some kangaroo populations may be decimated by people eager to profit from the reopening of the U.S. market.

Australia, which is about the size of the United States, is now home to about 32 million kangaroos. Until 1973, when the country put an 18-month moratorium on exports, kangaroos were the basis of an industry estimated to be worth $5 million a year, most of it in hides. In the late 1960's, exports amounted to some 850,000 hides a year, more than half of which went to the United States. The hides,



which are tough, flexible, and durable, are used for such items as shoes, saddles, briefcases, and baseball gloves. In the past 5 years a modest trade in hides and in kangaroo meat for pet food has been going on with Europe and Japan. The demand has been decreasing, and currently Australian tanners are said to have at least a half-million hides in storage. Australia has for some time been pressuring this country to lift its import ban. According to conservationists, the pressure is coming from the kangaroo industry, but according to an official at the Australian embassy, it is farmers and graziers who have made the biggest fuss. In some areas, kangaroos compete with cattle and sheep for grazing land and trample crops in their noctural boundings.

Stanford Picks Donald Kennedy

Donald Kennedy, the only Food and Drug Administration (FDA) head in history that almost everybody was happy with, has been appointed president of Stanford University. Kennedy, a Harvard-educated biologist, spent 20 years teaching at Stanford and returned there as provost last year after 2 years heading the FDA. Everybody seems to be happy about Kennedy at Stanford, too, which is reputedly the best private university in the West. Stanford has acquired its eminence largely through its science program. Now, says Kennedy, "we have to try in the 1980's to get the humanities where the sciences have gotten."

Constance Holden