condition. It is suggested that small commercial trials of this wax treatment be made. A concentration of 6 to 8 per cent. solids in the emulsion is suggested.

It was found that the volatiles from one lot of apples may induce scald on a second lot. Susceptible varieties scald much sooner and more severely in the presence of volatiles from McIntosh apples than when stored alone. This was true both in ordinary cold storage practice and in "controlled atmosphere storage," where carbon dioxide and oxygen levels as well as temperature and humidity were controlled.

Progress has been made in "air conditioning" the storage atmosphere to rid it of these harmful volatiles, but absolute scald control by this method has not yet been attained. The more promising materials which have been used in the air-conditioning process have been various oils and activated charcoal. Failure to attain complete control of the disease by this method may be attributed partially to a lack of knowledge as to when the absorbing materials became saturated.

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A GRASSHOPPER PROBLEM IN MECHANICS

A FRIEND on a farm, having to move a hive full of bees, asked me whether the hive would weigh less if the bees were stirred up so as to fly around inside the closed hive while she carried it. This suggested a similar—but mathematically simpler—problem: Will a suitcase containing a pound of grasshoppers weigh less if the grasshoppers are jumping so that half of them are constantly in the air in the suitcase than if all are constantly at rest?

If a grasshopper of mass m jumps with a vertical velocity v, the downward impulse on the suitcase is mv when he jumps and also when he alights, which will be $2v/g$ seconds later if he strikes nothing; therefore if n grasshoppers are in the air half the time, the average downward impulsive force due to the change in momentum is one half of $2nmv$ divided by $2v/g$, that is $\frac{1}{2}nmg$; and this added to the weight of those at rest gives the dead weight of all. In other words, the total average weight is the same whether they are jumping or not. This is, of course, the kinetic theory explanation of the downward pressure exerted by the weight of a gas. It should be noted, however, that only the average weight is the same. If a box containing a single grasshopper is suspended from a sensitive spring balance, every time he jumps the box will receive a downward kick. So the indicated weight of any body not at absolute zero is partly static and partly kinetic, and is a statistical average sum of varying static and impulsive forces.

The hive-and-bees problem is more complex; but in this case also, of course, the total average weight must be the same no matter what the actions or motions of the bees and other parts inside the closed container may be.

This problem is doubtless very old, though I do not happen to have run across it before. References to previous discussions of it will be appreciated.

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SCIENTIFIC BOOKS

EPILEPSY

Epilepsy and Cerebral Localization. By WILDER PENFIELD and THEODORE C. ERICKSON. 607 pp. Springfield, Illinois: Charles C Thomas. 1941.

A RARE kind of devotion to suffering humanity and science is needed to keep a man working at a disease such as epilepsy. The patients are deeply distressed and distressing to the physician because many can not be given much aid. Lennox in his recent book, "Science and Seizures," has shown this spirit and has written a book from the medical and social view-point. Now comes "Epilepsy and Cerebral Localization," by Penfield and Erickson, from the surgeon's point of view. But these men are more than surgeons; they have approached the entity called "epilepsy" from the physiological standpoint; they have made histological studies and finally, with the aid of the special laboratories of Dr. Jasper and Mrs. Erickson, respectively, they have taken up electroencephalography and psychology, as related to epilepsy.

A series of proven cases of focal epilepsy treated by craniotomy provided the major source of material for physiological, psychological and anatomical studies of the human cerebral cortex over a ten-year period. The histology of cerebral scars, the cytology of the brain, the structure and control of cerebral vessels and the physiology of cerebral blood flow have formed the subjects of what might be called their preliminary research. During the process of clinical elaboration, collateral studies were made upon patients suffering from all types of convulsive states by electroencephalography and pneumoencephalography as well as by the analysis of seizure pattern and clinical picture. At the same time related medical literature has been freely used. For students of neurophysiology the direct observations made upon the cerebral cortex of conscious patients and the descriptions of patterns