

Money from Moulds—Continued

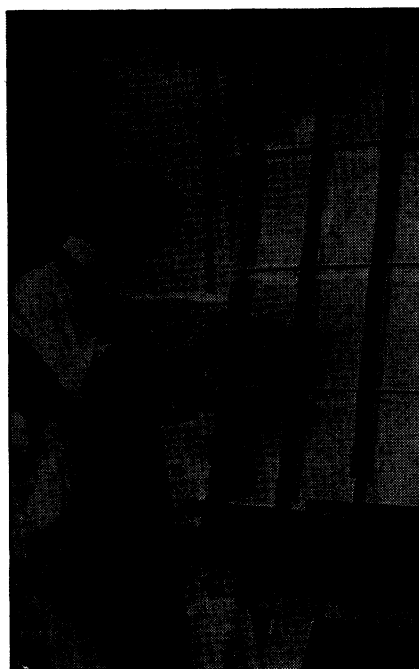
California, which extracts the product from fruits rejected as unfit for packing in the orchard regions. Paradoxically enough, the mould that makes citric acid belongs to the same group as the "green mould" that spoils many lemons in shipment and storage. Citric acid is widely used in industry and medicine. It forms the basis of lemon extract used in flavoring. And no big-league baseball game can be successfully run without it, for citric acid is indispensable in the manufacture of pop.

But the manufacture of gluconic and citric acids with the aid of fungi is only a modern manifestation of a very ancient craft, which, like many another handiwork of men that dates back to times older than history, has been carried on in total unconsciousness of the scientific secret underlying the process. Man has been a fungus-user from time immemorial, in many of his most widely practiced arts, but especially in those that have to do with the preparation of food. For, oddly enough, though he usually refuses to eat anything that is visibly mouldy, he has a perverse preference for some things that are the results of mould action on raw materials that are really good food materials when they are fresh.

There is cheese, for instance. Cheese is nothing but milk curds that have been allowed to stand and get all mouldy. The older and mouldier the cheese the better it is. Watch a seasoned gourmet selecting some choice Parmesan some time. He picks the cheese with green whiskers every shot!

If, during the recent celebrations at the coronation of the Emperor of Japan, you had suggested to a loyal subject of that monarch that he was drinking health and long life to his sovereign in mouldy rice-water, you would probably have found yourself involved immediately in something resembling a war. But *sake*, that potent rice wine that is Japan's national drink, is produced from an infusion of rice by the action of a mould. Similarly, *sho-yu* sauce, which you find in hair-tonic bottles in the chop-suey restaurants, is prepared from soy beans by fermentation with moulds. The same sauce, plus a lot of pepper and some other cryptic ingredients, becomes Worcestershire sauce.

Not only moulds but their relatives, the bacteria and yeasts, are old-time though until recently unknown allies of man in his food-preparing. Mankind has been making the two big



RETOUCHING one of the wide metal culture trays with acid-proof lacquer

B's, Bread and Beer, a great deal longer than he has been making written history; both are yeast products. Noah's disastrous adventure with some wild yeasts is well known; and the elaborate "purging of the old heaven" practised by the Jews at Pesach is simply a precaution needed to keep the household culture of yeast pure and uncontaminated, backed by the force of religious authority.

Bacteria are not so closely related to the moulds as are the yeasts, but they are still regarded as members of the fungal cousinship. Bacteria have

to act on cream before it can be made into butter, and bacteria-treated milk, under a variety of trade names, is now a widely used health food. Some cheeses are made by the action of bacteria on milk solids. Sauerkraut, another ancient food now coming to be regarded as "good for you", is simply shredded cabbage that has undergone bacterial fermentation.

The industries depending on moulds, yeasts, bacteria and other forms of minute plant and animal life are now just on the threshold of passing from the old rule-of-thumb, empirical methods of the ages to the new, exactly controlled, scientific methods of the future. Making citric and gluconic acids with the help of moulds, controlling the fungus flora of food factories and dairies, manipulating the growth of yeast in bakeries, are only pioneering steps. The time is coming when these microscopic fungi will be grown not for their by-product but for themselves, when yeast by the ton will be cattle food or perhaps even human food, and when the cellulose bodies of now despised moulds will perhaps be moulded into "art ivory", or dissolved and spun into rayon, or made into glistening lacquers for motor cars. The possibilities of micro-agriculture are only beginning to be opened up.

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In the 15 years between 1851 and 1866, the floods which altered the course of the Yellow River of China took the lives of more than 30,000,000 people through drowning or malnutrition.

New Ideas on Personality

Psychiatry

The keynote of the present tendency in psychiatry and psychology is the appearance of the idea that personality is not just the physical constitution and psychological and mental traits, but the integration of all of them, declared Dr. Karl A. Menninger, director of the Menninger Clinic of Topeka, Kans., at the opening session of the American Orthopsychiatric Association's sixth annual meeting in New York.

Psychiatrists must break out of the vicious circle, known to medical men, into which they are now falling, advised Dr. James S. Plant of the Essex County Juvenile Clinic of Newark, N. J. He said that psychiatrists and social workers, seeking a cause

for the child's behavior problems, were going back in a procession to an earlier and earlier period in the child's life, to the prenatal period, to the parents and finally to the parents' childhood. There was no telling where this might lead to, he said. The surgeon, confronted by the vicious circle in medicine, does not seek the original cause but tries to cut out the immediate cause of trouble. Psychiatrists should try more to relieve actual conditions without looking too far for their ultimate cause, he advised.

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California leads this country in power farming, Wisconsin running a close second.