AGRICULTURE

Climatic Doubles Are Charted

By careful comparison of crop regions of the world suitable homes may be found for more productive emigrant crops to replace low-yield natives.

By DR. FRANK THONE

➤ HAVE you ever met your double? Doubtless you have had the slightly awkward experience of being warmly greeted by a stranger, who calls you by a name you have never heard and asks you about a family you don't have in a town you have never seen. After you have convinced the cordial stranger that you are you and not somebody else, but no offense taken, he may still insist, "But you sure do look like him, anyway!"

Being a double sometimes proves profitable, if your unknown counterpart happens to be a movie star in need of a stand-in. If he happens to be a political dictator afraid of being shot at, the resemblance may be less of a matter for self-congratulation.

Places as well as persons have doubles, scientists tell us. Somewhere on this globe the locality you live in is so closely duplicated in essential climatic features that you could settle down there and hardly notice the difference—except that the neighbors might be Chinese or Zulus instead of familiar American faces. But you'd see corn or cotton or wheat in the fields, and somehow the sight would make you feel at home.

Immigrants' Adjustments

In a rule-of-thumb sort of way, this has long been recognized in immigrants' adjustments to new lands. Early German comers were fond of the Rhine-like banks of the Ohio ("Vass you effer in Tsintsinnati?"); Scandinavians have tended to concentrate in Wisconsin, Minnesota and the Dakotas; Ukrainians found Canada's prairie provinces inviting; colonizing Spaniards and later-arriving Italians saw their homeland hills replicated in California.

More exact identification of geographic doubles is needed, however, in the exacting business of finding suitable homes for emigrant crops. The world is hungry now, and at the rate its population is increasing it will get even hungrier unless every acre is made to produce its maximum of food. To do this, it may be necessary in many places to replace low-yield natives with more productive strangers. It is no time for tradition or sentiment.

However, neither is it time for hit-or-miss experimentation. It was luck that an obscure tuber from the cool lands of Chile succeeded so well in northern Europe that it is now known as the "Irish" potato. Luck, too, that tobacco from the New World found congenial conditions in Turkey and Egypt. We hear of such successes, but not of failures: how American corn was found unsuitable in Germany, or European grapes for the Atlantic seaboard of this country.

To insure the highest possible success score on first tries, and to reduce the number of costly false starts, the logical thing would seem to be a careful comparison of crop regions the world over, to find where else its climatic and other conditions are duplicated. Then we can do a better job of distributing such seed stocks as we have for rehabilitation purposes. Also, we can take a good look at what our neighbors' land does well with, and know where to send the seed we swap for—whether a new soybean variety should go to Illinois or Georgia, or whether something choice in celery should be tried out first in Michigan or Florida.

Identifying "Doubles"

Here is where the American Institute of Crop Ecology comes into the picture. It is a relatively new organization, small as yet, headed up by Dr. M. Y. Nuttonson, formerly a senior agronomist in the Office of Foreign Agricultural Relations in the U. S. Department of Agriculture. The Institute has undertaken the ambitious program of examining all available data on the world's climates, identifying "doubles" in terms of crop-raising possibilities and spotting them in on the map.

Dr. Nuttonson knows that the task will not be an easy one. There are still vast blank spaces on the climatological maps, where observers have been all too few. However, even in lands that might seem at first glance most unpromising there are sometimes surprising numbers of forward-looking officials and scholars, as well as helpful missionaries, traders and other foreigners. Colonial and former colonial areas are better sources of information, and of course countries with long histories and stable cultures are the richest mines of data.

In working out the climatic picture for any given locality such sweepingly general figures as average annual rainfall, mean temperatures for summer and winter, and direction and average velocity of prevailing winds will not do. Too many deadly extremes can be deceptively hidden in these flattened-out averages. There must be breakdown into smaller units—monthly highs and lows as well as averages.

Length of growing season is important; it is determined as a rule by the number of days between the latest killing frost in spring and the first freeze in autumn. Number of hours of daily sunshine enters into the formula; longer days in such places as Alaska and Norway may offset to a considerable extent the lower temperatures. The number of seasons for which complete records have been kept is of importance, too: the longer the record the more dependable it is likely to be in getting at averages, and the more likely it is to show really critical extremes.

After Dr. Nuttonson has compiled all available figures for as many observation points as possible for a given region or country, he marks in on its map, in parentheses, the names of the American states with climates most nearly resembling those of its provinces or other divisions. These pairings he calls "climatic analogues."

Climatic Analogues

Perhaps the most interesting job of this kind he has done so far is the climatic-analogue map of China. Territorially, Greater China is considerably larger than the United States; its extent is about the same from east to west, but greater from north to south. Hence some of its climatic analogues must be expressed in terms of Canada rather than of the United States.

Thus, on his map the notation (Manitoba) appears across the northernmost part of Manchuria, with (Saskatchewan) somewhat to the southeast of it. Southern Man-

WEST GOES EAST—Tobacco, a plant of American origin, growing on a plain a dozen miles east of Rome, is being picked by an elderly Italian woman.

NORTH GOES SOUTH—Wheat, a crop that originated in the Northern Hemisphere (probably somewhere in the Near East), is being harvested by a husky Maori native in New Zealand.

churia bears the notations (South Dakota) and (Nebraska). Korea is likened to Minnesota and the great Chinese peninsular province of Shantung is equated partly with Kansas, partly with Wisconsin.

At the other extreme, such southern Chinese provinces as Kunnan, Kwangsi and Kwangtung, which are usually frost-free the year round, all bear the notation (Florida). The name of Texas appears in a number of places on the map.

It is even possible, in many instances, to find climatic "doubles" in this country for individual cities in China. Thus, the American city with a climate most nearly like that of Peiping is Salina, Kans.; Dr. Nuttonson adds the remark that Salina is "slightly warmer." The climatic analogue of Canton is Cedar Keys, on the Gulf coast of Florida; that of Nanking is Pawhuska, Okla. Harbin, in Manchuria, has a climate most like that of Winnipeg; remote Urga, in Mongolia, has its "double" in the northwestern Canadian city of Prince Albert.

These climatic analogies between China and North America do not surprise scientists. Agronomists recall how quickly China adopted such New World crops as corn, potatoes, peanuts and tobacco, and how we in turn have received such good gifts from China as soybeans, rice, citrus fruits and tung trees. Botanists have long pointed out the curious fact that prominent in the Chinese flora are trees like the chestnut and shrubs like rhododendron, which we are apt to think of as peculiarly American. The value of Dr. Nuttonson's studies lies in the closer pin-pointing of these hitherto generalized facts, with consequent possibilities of earlier and more profitable applications to practical problems.

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INVENTION

Calves Feed Themselves From Nipple-Equipped Pail

➤ "BABY-SITTER" for bossy-cow is a newly designed milk pail with a plastic nipple near the bottom, for use by the calf separated from its mother. It is a product of General Electric, far removed from the giant electric generators and 50,000,000-volt atom-smashing betatrons which the same company builds.

Hung on a fence, it enables new-born calves to take their milk under conditions similar to natural feeding, so that they can be separated from their mothers two days after birth. A check-valve, made of molded plastic, compels calves to drink in small sips and keeps them from gulping large quantities of air.

This new calf-feeding device has a name of its own. It is a "calf-teria" and it is to be marketed by the Calf-teria Company of Fort Wayne, Ind.

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ENGINEERING

Fertilizer Material Mined Faster with New Equipment

➤ EIGHT tons of potash ore for fertilizer is now dumped each minute from a new mine hoist in Carlsbad, N. Mex., which carries the ore automatically to the surface from 1,150 feet below ground.

Two ore buckets, or "skips", each with an eight-ton capacity, operate in the vertical shaft, alternately being loaded and hoisting the ore to the surface. The new "push-button" drive and control equipment, driven by a pair of 500-horsepower motors, was developed by the General Electric Company.

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