

to the country many a good technician—and also many poor ones who had come to Mexico through favoritism. Mexico's industries are not mature; the freedom to strike is possibly abused; but the workers are on their feet. What I fear more than their temporary disorder and partial competence is the incursion of bourgeois values, such as corrupted British labor.

Compare a company town like the American Smelting and Refining Company's "Avalo" refinery near Chihuahua with the autonomous oil refinery of Atzacopalco, and you will see the growth in dignity and order that full control of the C. T. M. brings. In the "Avalo" the order is dark and dead; a subtle humiliation inheres in the neat houses. Symbolically, the place is without trees,

except for the walled inclosure where the foreign bosses live, their houses smothered in foliage. High up in the Sierra is the silver town of Santa Eulalia: dirty, noisy, chaotic, buried in the dust of the bad roads. The workers of "Avalo" must free themselves of an external oppression that has brought spiritual squalor; the workers of the mining town must find a discipline and method for the life within them. This, Lombardo's leadership offers. But it is not enough. It lacks sufficient place for the intuitive processes—not irrational but prerational—which gave birth to the Mexican revolution and whose neglect has given strength to all the counter-revolutions.

[The concluding article of Mr. Frank's series on Mexico Today will appear in next week's issue.]

Reclaiming the Dust Bowl

BY KUNIGUNDE DUNCAN

Wichita, Kansas, August 21

TO THE eternal drama of man's struggle with the elements the people of the American Dust Bowl are contributing a scene of victory. These farmers of the high plains have pitted brain and muscle against a six-year drought which was superinduced, meteorologists say, by the fact that the sun, an incalculably strong adversary 93,000,000 miles away, is a variable star. Cyclic drought caused by solar variability, as predicted and charted by Dr. Charles G. Abbott of the Smithsonian Institute, recurs at periods of eleven and a half, twenty-three, and forty-six years, the forty-sixth-year variation being of greatest intensity and longest duration. Fortunately, out of his recent experience in the Dust Bowl, the plainsman has forged weapons with which to conquer the next great drought, due in 1975 by Dr. Abbott's calculations.

The high plains have never had abundant rainfall. But when the annual precipitation of from fourteen to twenty inches decreased to from eight to fourteen, the situation became acute. "Dusters" began to boil up and shut out the sun, and everywhere the question was asked, "What shall we do?" It was a question that remained unanswered for many months while gas engines refused to run and locomotives crawled through a springless, viewless land—a land where people lived with windows weather-stripped tightly with adhesive tape to exclude the penetrating silt; where wet sheets were hung above beds and about the walls to save the lives of the old, the ill, and the new-born; where cattle that had escaped paralysis and death caused by eating drought-spoiled roughage were shipped to a distant grass and water supply or shot down; where paint was ground from wooden buildings by sand

abrasion; where water from deep wells after standing an hour in stock tanks bore a blue, oily scum; where a weird purplish sun guided the funeral processions of those who had died of dust pneumonia.

The Dust Bowler, seeking a means of combating these terrible conditions, went first into causes and found that he was having to fight more than super-temperatures, water shortage, and constant wind-whipped dust. He was having to fight the mistakes of his predecessors. The financiers who had pushed the railroads across the prairies had rushed in settlers who, not content with good cow country, had set about growing the crops they were used to "back East" by methods used in abundant-rainfall climates. The cattlemen in the early days of a "free range" had overgrazed the prairies with their enormous herds, banked their piles, and left. The World War demand for bread and more bread had led men to plow under millions of acres of drought-resisting, soil-clamping buffalo grass and sow the land to wheat.

Study brought to light the startling fact that farmers all over the country, greedily cropping to the very brink of streams, had left loose soil to wash away during those months when no crop was growing and had thus lowered the water table in a much larger area than that actually suffering from blowing dust. Real-estate speculators who drained swamps thousands of miles from the Dust Bowl helped to make it. In Iowa, Minnesota, Nebraska, and the Dakotas the water table was found to have been lowered from eight to forty feet during the first twenty years of "settlement." The high plains suffered a greater drop. Where water had formerly been reached at 90 feet, it was found at 150. In New Mexico ancient Indian wells 250 feet deep went dry.

There seemed to be but two solutions to the Dust Bowl problem: to make more rain fall, or to save every drop that did fall. Church people prayed. A faker raked in dishonest dollars for a while by foisting his battery-and-wire "sky squeezer" upon overcredulous communities. But no rain fell. Higher temperatures, higher winds, more suffocating "black blizzards" prevailed. Harassed on all sides, blamed by suitcase farmers as a "Sahara maker," obliged to exist somehow in his dust-ridden land, with grasshoppers stripping what few crops he could wrest from his blowing fields, this man of the plains, this fellow-of-the-furrow, kept both his head and his courage. Conservation alone remained. He called science to his aid. Meanwhile, he was able to exist with the help of emergency-relief, civil-works, agricultural-adjustment, and rural-rehabilitation agencies working in conjunction with the United States Department of Agriculture soil-conservation service, operating from the agricultural colleges of the states affected—Kansas, Colorado, New Mexico, Oklahoma, and Texas. The state governments, too, made liberal money grants.

Yet money and man-power, tractors and food would have been helpless against the scourge had not an Oklahoma farmer, H. H. Finnell, been able to figure out the way to "stop rain in its tracks," as he put the problem. Impressed by prayers for rain at the church where his parents took him as a small boy, Finnell concluded that God was doing his part to make rain fall, but that man was remiss in not using his wits to save and store rain. He later developed the theory that even with the scant rainfall of his part of the world good crops could be grown if men knew how. Working on the experimental staff of Panhandle Agricultural and Mechanical College, he evolved and tested his now famous contour-terrace system of tillage, which has been the greatest single factor in Dust Bowl reclamation. Upon his appointment as Regional Soil Conservator in April, 1935, Finnell and a fellow-Panhandler, Bert W. McGinnis, tackled the titanic job of catching all the rain that should fall upon 227,000 square miles of floury, water-shedding silt, storing it in that soil, and making it produce food for man and beast.

Finnell preached two things: know how to save rain; know how to use it. Rain, to be saved, must be stored in the soil where it cannot evaporate. To make it sink into the soil, terrace and contour tillage can be depended upon for 100 per cent effectiveness. In contour plowing the deep, flat-bottomed furrows follow the contour of the land, as determined by expert engineering. Such a series of furrows will catch and hold, until it sinks in, any runoff from the land which lies between contours. If the land between the contour furrow lines is terraced, that is, made exactly level—another expert engineering job—it will absorb to capacity any rain that falls on it, especially if its surface has been deeply tilled. Where the incline of

land is very steep, spillways at alternating ends of successive terraces will cause the unabsorbed water to descend by such a roundabout way that, as one worker explained, "it just gets disgusted and quits."

While some scientists studied South American fields which have been under cultivation by Inca Indians for five hundred years and others searched Turkestan for soil-retaining, drought-resisting plants, Finnell and McGinnis directed twenty-six "demonstration stations" at the worst points in the Dust Bowl. Four years ago these farms were tiny green islands in an ocean of dust. Today these islands are growing into green continents. This incredible feat could never have been accomplished had it not been for the high intelligence of the plainsmen and the giant strength of the tractor. When, after the first year, with the least rainfall yet, these demonstration farms produced crops superior to any grown in normal seasons, farmers stood in line to sign applications for the free services of engineer, surveyor, chemist, agronomist, forester, and range examiner.

When contouring and terracing were not feasible, other modes of reclamation were put into play: strip farming, building lakes and ponds, retiring tilled land to grass, utilizing stubble, using new varieties of crops and breeds of cattle, planting trees, and dozens of minor schemes. Strip farming is planting a variety of crops in strips in the same field, the strips being only a few yards in width. Kaffir, broom corn, and grama grass, which have soil-retaining roots, alternated with cotton and beans, which have loosely growing roots, interrupt the force of the wind against the soil and afford in some soils almost complete control of blowing dust. Ponds and lakes for flood prevention and watering stock are being constructed by the thousands. Sloughs are furnished at their heads with "water spreaders" and planted with tough shrubs and tenacious-rooted plants. Water holes on the ranges have been removed to new sites and additional ones made to permit the new system of rotated, deferred, and seasonal grazing which is giving the worn-out parts of the vast range lands a chance to recuperate. Drainage from uncontroled fields and pastures is being led back on to the fields instead of permitted to flow away and be wasted in highway drainage ditches.

The farmer has become grass-root conscious. The intensive survey which reclamation has entailed has brought out the fact that too large a percentage of the high plains—32,000,000 acres—has been under cultivation. Thousands and thousands of acres of this land are being returned to grass sod, sown to native varieties. Buffalo grass, the native, tenacious, drought-resistant ground cover, has such minute seeds that they must be winnowed by vacuum cleaner. The larger native grasses—blue stem, wild rye and millet, dropseed, and a dozen others—are being harvested and threshed by combine. Excess seed is stored for future use. Retiring cultivated land to grass

means that cattle grazing is to regain something of its former importance. Farmers have learned to leave eighteen-inch-high stubble in the fields, never to burn off fields, never to till fields until just before seeding, and never to permit stock to feed so long in stubble that they destroy the vegetation and give the elements a chance to start a small duster from the trampled soil. Stubble has come into its own as a soil stabilizer when plowed under or left to stand and as a humus maker and moisture retainer when left in the soil.

Bumper crops grown under drought conditions, with these new farming methods have stimulated experimentation. Clover and alfalfa, never before considered possible plains crops, are being grown profitably. Contouring has invaded even native grass pastures and ranges, for it can be depended upon to double and even triple the grass yield. Innovations in the way of cattle breeds—in the Indian country of New Mexico, for instance—are proving that smaller herds of better breeds can be as profitable as large herds of poor breeds while using half as much pasture land. With all these changes wild life is increasing. Wild turkeys, plover, quail, wild pigeons, prairie hens, even beaver and foxes are returning.

Aided by WPA and federal subsidy the Dust Bowl people have planted 50,000 seedling trees and are to plant millions more. The six to eight feet of height and branch-spread of the oldest of these trees, now four years old, promise much for the plainsmen of tomorrow. One day they will be pouring humidity into the dry air, adding humus to the soil, breaking the sweep of the incessant prairie winds, and making impossible a return of the "black blizzards."

Thus is man winning his fight against the variability of that mighty star, our sun; against the carelessness and greed of those who preceded him and of his fellows in other parts of the country. His success thus far has been significant enough to assure complete reclamation of the Dust Bowl. His tractor-fought battle has attracted agronomists from Australia and Canada, Palestine and China, South Africa and the Argentine. Meanwhile, in the areas where the dust is still blowing, notably, eastern Colorado, western Kansas, and eastern New Mexico, the battle still rages. Women still seal windows against dust, clean house with shovels, not brooms, protect babies with wet sheets, and endure a scourge more cruel than Indian raids, a scourge which can only be conquered by a courage and an endurance superior to that demanded of the early pioneers.

Astronomers who see Mars as a drying planet, who suggest that its lineal markings are irrigation canals, may be viewing the final scene of the drama of man's battle against the elements. The Earth is far from that stage. Our cyclic droughts are followed by periods of normal moisture. The annual rainfall in the Dust Bowl is on the increase; in places it is already normal or above normal.

In the Wind

WAR NEWS: The British *Sunday Pictorial* reports that the headmistress of the Beckenham County school has instructed her 450 female pupils to learn three funny stories "as an air-raid-precaution measure" and to keep them secret until war breaks out. The stories "must be of suitable character, easy to understand, and they must be funny," the headmistress explained; "the idea is to keep the girls in high spirits through an air raid." One pupil complained that she could hardly wait: "I have three beauties already."

WHEN KING ZOG, Albania's fallen ruler, arrived at Oslo recently with his queen, he found that accommodations had been reserved for them at the Rome Hotel. The King seemed not to enjoy the irony and insisted on waiting at the station until the plans were changed.

TRYING TO prove that party members weren't jarred by news of the German-Russian pact, the *Daily Worker* kept up a steady appearance of optimism in the ensuing days. Even the sports page inadvertently fell into line; it contained a three-column story under the headline: "Reds Not Jittery, Says McKechnie."

LATEST "UNDERGROUND ITALY" *bon mot*, relayed by the *Living Age*: "If we had half as much to eat as we have to swallow, we would lead a marvelous life."

DURING THE bitter fight over the President's lending bill, the Easton (Pa.) *Express* carried this headline: "Economy Bloc Chiefs Lash at Roosevelt." The continuation head was: "Economy Blocheads Lash at Roosevelt."

FROM THE radio page of the Hartford (Conn.) *Courant*, August 29: "7:30 and 9—MBS chain, Raymond Gram swing comment." . . . Picturesque headline in the Columbia (S. C.) *Star*: "Hitler Coils to Strike."

BECAUSE BRITISH libel laws are severe, journalists have developed a language designed to evade them. The most recent example, cited by the *New Statesman and Nation*, was a poster advertising an evening paper's scoop. The poster read: "Mystery Man's Alleged Statement."

FATHER COUGHLIN'S Christian Front is upset by the improved behavior of the New York police: it is reported that Front officials have now protested to the Civil Liberties Union that the police are "discriminating" against them. . . Robert Dell's description of Anthony Eden in connection with his visit to the United States last winter: "The sweetest Tory ever sold." . . S. J. Perelman's description of conservative Jews who try to hush-hush anti-Semitism: "The Talmud Tories."

[The \$5 prize for the best item submitted during August goes to L. Robert Joseph of Hollywood for the item about the San Gabriel Bund published last week.]

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