



Dr. Frank Record, MIT mainstay who also spent the summer of 1953 here, checks the meter, which recorded the colorless tracer emitted from an isolated pipe. Tank (left foreground) is a mixer.—The Frontier Photo.

Diffusion Days Are Over

(Continued from page 1)
 scientists for their specific problem or problems, spells to us a city of temporary huts, a carload of test tubes, delicate anemometers, wind vane, electronic brains, computers, wind towers and acres of erect steel fence posts forming successive semicircular patterns in a big, empty pasture.

Operation Diffusion might have been a more appropriate title, because other activities at the J. B. Ryan pasture went along for the ride. Or, better yet, Operation Confusion as the office wag tells it, because the layman doesn't have a chance on these acres of pasture where there isn't even a tree.

Here we are, six miles north-east of O'Neill, a "run" about to get underway. Night or day makes not much difference to the scientists.

It's 2 p.m., and the wind is in a southerly direction. Picture an isolated 3-inch pipe about two feet high protruding from the sod. It's from that pipe the tracer (gas) is to be emitted. Fifty feet south is a giant meter, a mixing tank and a bottled gas supply.

Fifty meters north is a semicircle (with the arc to the north) of steel fence posts with delicate test tubes mounted on each post. One hundred meters away, another; 400 meters, another; 800 meters, still another.

The samplers are exactly spaced 2 degrees apart (6 feet at the 50-meter arc; 46 feet apart at the 100-meter range). On the 800-meter semicircle, the tubes are 1 degree (or 46-feet) apart.

Five hundred fifty test tubes are perched atop these posts — and surface hose connects to provide a partial vacuum in the tubes.

Precision and exactness pervade the whole effort.

The pipe sticking in the ground begins to emit the colorless tracer; the busy little test tubes go to work. Wind must be generally from the south in order for the tracer to penetrate northward into the network.

At 2:30 p.m., the squad of runners with test tube baskets hustle the containers into the temporary air-conditioned laboratory. Acid in the bottles is measured in terms of ohms (electrical resistance). Each reading is recorded.

With the wind right, the procedure will be resumed again at 4 p.m.—with thoroughly rinsed bottles. If everything functions smoothly, there may be up to 10 minutes to spare between "runs."

Sometimes the MIT workers have been obliged to wait days for favorable weather. These tracer experiments were done in miniature back at Round Hill, near Boston, Mass., but the entire project was magnified and expanded for Prairiegrass.

Meanwhile, the air force weather detachment is sending balloons aloft. These expendable, robot, free balloons are radiating back weather information at regular intervals.

The mobile detachment is from the Sixth weather squadron, Tinker field, Oklahoma City, Okla.

A small L-20 aircraft, laden with weather graph instruments, busily plies the sky, making low-level temperature and wind ve-

locity readings. And, simultaneously, at every nearly surface level, the anemometers and wind vane feed tiny impulses into electronic brains, recording minute changes in wind speed, direction, velocity and other necessary data.

The pilots are Lts. George Sexton, a South Dakotan, and Al Clark.

Dr. Morton Barad, director of the project and a civil service employee in air force research, tells us not to fret over the voluminous data being gathered at every nook-and-cranny of the big pasture where normally contented cattle graze.

"In a year or two we'll have it all correlated and reduced to where we can work with it."

"This is basic research," the sandy, bespectacled family man explained. "Any portion of what we're doing, without the supporting data from the rest of the project, wouldn't mean much."

Doctor Barad learned back in 1953 that one day, several years hence, he would be taking a crew to O'Neill (or to some similar place) and work toward the solution of certain problems. Even when the 1953 wind test group was returning to Cambridge, paper work was being advanced for Project Prairiegrass.

Scientists, like everyone else, have budget troubles. Their priorities are fixed. Assembling costly equipment and getting personnel for the particular work is not easily accomplished two or three years in advance.

Time passed.

The '53 wind test—a minute study of wind turbulence at low level—became a voluminous meteorological book (a world standard) and even a documentary film was developed by the air force. But these came only after weeks and months of analysis and study.

About a year ago the Prairie Grass appeared to be a certainty. The project (smaller in scope than the '53 test) was fairly well defined and only the domestic problems remained.

O'Neill hospitality of '53 and intimacy with the terrain and "housekeeping" services here allayed any doubts but what the project could proceed on schedule at O'Neill.

During early 1956 Doctor Barad and Dr. Harrison Cramer of MIT came out to make preliminary arrangements. The people moved in en masse in May and now, early September, Project Prairiegrass is tucked away on rolls and rolls of graphs, stacks of magnetic tape, thousands of feet of film, and mountains of charts.

More now about the goings-on at hand.

There are eight huts, a half-dozen vans and a small fleet of utility GI vehicles including (you guessed it)—jeeps.

Let's look in on these other trailer outfits.

The Wisconsin group, under Dr. Vern Suomi, primarily is concerned with the heat budget and such problems as how much energy is reflected from a sandhill? How much from a cornfield? How much from a piece of prairie pasture? In some instances they send an aircraft aloft as far away as Iowa to gather comparative data.

Wisconsin also wants to study a theory of "hot spots"—areas in

the atmosphere where tornado storms are born. Who knows? This may lead to a highly successful tornado warning network in our great land and save untold lives and help reduce property losses.

Generally, Wisconsin's research, like during the wind test here in 1953, has agricultural and domestic application.

Texas A&M likewise is concerned with problems having agrarian features. The Texans are rigged to study the amount of moisture evaporation coming out of the earth—in this instance, the prairie.

Both the Wisconsin and Texas A&M studies supplement MIT's meteorological activity.

Wisconsin's Suomi headed the Badger group's studies here in 1953. Texas A&M's work is headed by Dr. Maurice Halstead, who headed the Johns Hopkins university project here in 1953, later transferred to College Station with specific problems in mind for O'Neill, 1956.

Harry Moses of the Argonne National laboratories, Chicago, Ill., is an official observer here; also Doctor Lettau, who is remembered by Frontier readers as the chief meteorological officer for the German high command during World War II and ranks today as one of the world's leading weather experts.

Focal point before the start of a test is the downtown headquarters—located in a comfortable, improvised office at the Ryar haybarn premises. There a teletype machine keeps the project in touch with the weather bureau, getting regular reports as well as facsimile charts from Washington, D.C.

Fete Giorgio has been the chief forecaster at the downtown nerve center most of the summer. Pat Harney, another repeater from '53, has been the air force instrument man. Pat formerly was in the office of the U.S. weather bureau in Washington.

"The summer has been unlike the summer of 1953," lamented Doctor Barad. "Three years ago the wind would shift to the south and hang there day-after-day."

"This summer we'd get an indication on the charts the wind was shaping up for us. We work ourselves up to a fine, sharp point, ready for action. Often as not action never came."

"But the weather has been unpredictable everywhere this year in the upper half of the United States. We've gotten in our licks and are pleased with what we have—even before the analyses have begun."

"Distinguished observers have told us—and written us—we are doing basic research that should have been done long ago."

About the future?

Doctor Barad hopes he can present to higher echelons a case for perpetuating the O'Neill test site, just as his predecessors—Ben Davidson and Heinz Lettau, '53 directors, had done.

In any event, O'Neill will long live in the annals of meteorology based on what was done in 1953 and what is being finished today.

And, within a week or two, placid cattle again will be grazing where electronics brains were beating themselves out all summer.

Neligh Park Scene of Birthday Dinner

EWING—A family party was held Sunday at Riverside park in Neligh honoring the birthday anniversaries of Mrs. Hannah Tuttle and her son, Vearl Tuttle. A picnic dinner was enjoyed followed by a formal afternoon.

In attendance were the honored guests, Mrs. Vearl Tuttle and family, Mr. and Mrs. Archie Tuttle and daughter, Mr. and Mrs. Roy Tuttle and family, all of Ewing; Mrs. Grace Schmit of California; Mr. and Mrs. Glen Tuttle of Cherokee, Ia., and Mr. and Mrs. L. H. Weis of Meridian, Ia.

Other Ewing News
 Mr. and Mrs. Hans Peterson and family went to Neligh Saturday afternoon to join other relatives and friends in celebrating the 80th birthday anniversary of his mother, Mrs. Carsten Peterson.

Weekend guests at the home of Mr. and Mrs. Elmer Bergstrom were his brother and sister-in-law, Mr. and Mrs. Clarence Bergstrom of Omaha.

Mrs. John Walker and son, Bobbie, of Norfolk visited relatives and friends in Ewing last week.

Mr. and Mrs. Lyle Dierks went to Omaha Monday to take their daughter, Miss Sandra, there. She began employment there Tuesday.

Miss Mary Alys Dierks came home Friday from Omaha to spend the weekend with her parents, Mr. and Mrs. Lyle Dierks. She had been a guest of her cousin, Miss Judy Jefferies of Omaha, for a few days during her vacation.

Mr. and Mrs. Lee Spittler and Mr. and Mrs. Sam Regan picnicked last Thursday evening at the farm home of Mr. and Mrs. George Jefferies.

Mrs. Loyd West has returned home after spending some time with her parents, Mr. and Mrs. Gus Perlessein, at Bonesteel, S.D.

John Black, USN, who has spent a 30-day leave with his parents, Mr. and Mrs. Loyd Black, and family and other relatives, left Saturday to return to his base at Seattle, Wash.

Mr. and Mrs. James Tinsley and children returned home from a 10-day vacation. They spent last week at Merriman and Gordon. They also went through Yellowstone park and the Teton national park. At McCall, Ida., they were guests at the home of his two brothers.

Mr. and Mrs. Aaron Hadfield of Fullerton were recent guests at the home of Mr. and Mrs. Eben Graff. Mr. Hadfield is a brother of Mrs. Graff and Mrs. Hadfield is a sister of Mr. Graff.



James Peers of the MIT staff takes readings on automatic computers (known as electronic brains). The machines inside a van recorded wind velocity, wind direction and temperatures. The van, laden with costly electronic equipment, has a safe speed of 15-mph and was shipped to O'Neill in a rail box car.—The Frontier Photo.

CHURCH NOTES

METHODIST (Page-Innan)
 Rev. Leslie E. Mewmaw, pastor
 PAGE—

Thursday, September 6: WSCS meeting, 2:30 p.m.; junior choir practice, 4 p.m.; choir practice, 8 p.m.

Sunday, September 9: Sunday-school, 10 a.m.; worship, 11 a.m.; MYF, 8 p.m., with Miss Dorine Gled of Chambers showing pictures of the mission tour.

Monday, September 10: First quarterly conference, 8 p.m.

Wednesday, September 12: WSCS prayer hour, 9 a.m.; Scripture lesson, Luke 12:31-41; young adult fellowship meeting, 8 p.m.

INMAN—
 Sunday, September 9: Sunday-school, 8:45 a.m.; worship, 9:45 a.m.
 Tuesday, September 11: First

quarterly conference, 8 p.m.

Wednesday, September 12: Choir practice and MYF, 8 p.m.

Thursday, September 13: WSCS meeting, 2:30 p.m.; official board meeting, 8 p.m.

ASSEMBLY OF GOD (O'Neill)
 Rev. E. Kirschman, pastor

Sunday, September 9: Sunday-school, 10 a.m.; worship, 11 a.m.; MYF, 8 p.m., with Miss Dorine Gled of Chambers showing pictures of the mission tour.

Monday, September 10: First quarterly conference, 8 p.m.

Wednesday, September 12: WSCS prayer hour, 9 a.m.; Scripture lesson, Luke 12:31-41; young adult fellowship meeting, 8 p.m.

INMAN—
 Sunday, September 9: Sunday-school, 8:45 a.m.; worship, 9:45 a.m.
 Tuesday, September 11: First

Sunday, September 9: Sunday-school for all ages, 10 a.m.; worship service, 11 a.m.; Chris's Ambassadors (youth), 7 p.m.; children's service, 7 p.m.; evangelistic rally, 8 p.m.; Midweek service Wednesdays, 8 p.m.

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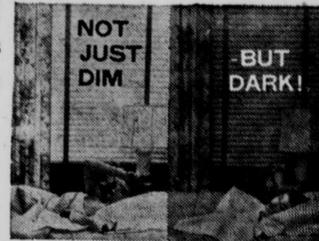
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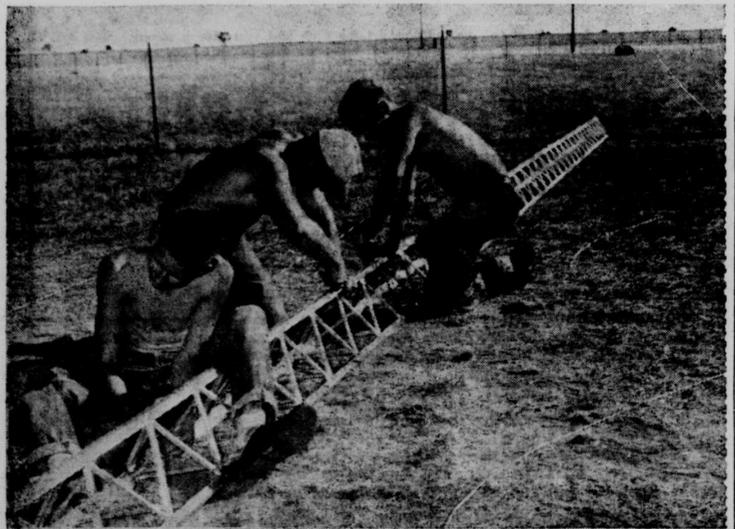


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Mending an anemometer tower: Ronnie Murphy and James Tomlinson, both of O'Neill, and John Luby, Jr., of New Bedford, Mass. Young Luby accompanied his father to O'Neill for the summer; Murphy and Tomlinson were among 30 high school boys used as runners and for odd jobs on Project Prairiegrass.—The Frontier Photo.