NEWS

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• Biochemical Engineering
• Fermentation
• Food Processing
• Nutrition
• Pesticides
• Plant Nutrients and Regulators

The 180-foot building contains a battery of powerful compressors. The three in the foreground, each 2000-horsepower, compress synthesis gas to aid the chemical reaction between hydrogen and nitrogen

New NH_3 Plant Meets Growing Needs of Western Agriculture

VENTURA, CALIF.—Shell Chemical Corp., pioneer in direct application of anhydrous ammonia as a commercial fertilizer, turned the valves at its new anhydrous ammonia plant here in formal opening ceremonies Dec. 11. The new $10 million plant, with an initial design capacity of 150 tons per day, together with Shell Chemical's plant at Shell Point, Calif. (present capacity, 300 tons per day), maintains Shell's position as the largest producer of anhydrous ammonia west of the Rockies.

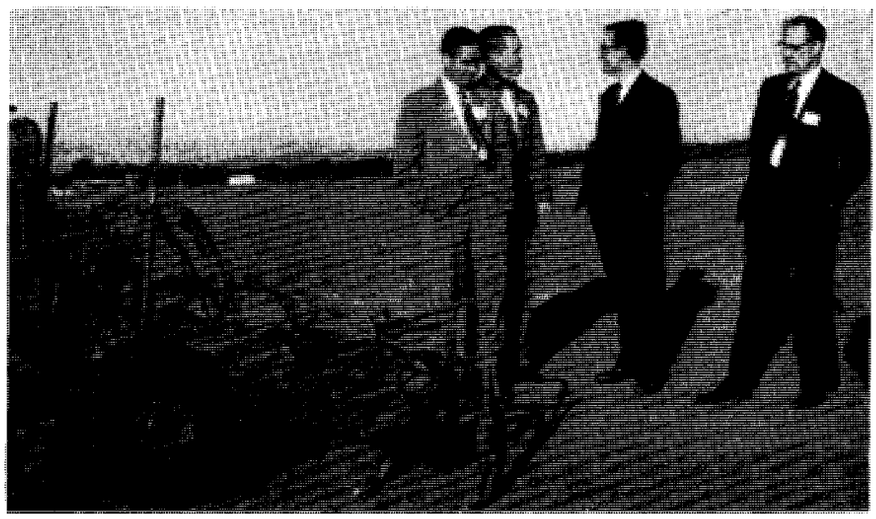
R. C. McCurdy, Shell Chemical president, noted that ammonia manufacture is one more example of the present trend in the chemical industry's contribution to the country's expanding economy: taking plentiful raw materials—in this case, nitrogen from the air and hydrogen from natural gas—to make a more useful product. By doing so, he said, the industry removes one more restriction to the nation's growth.

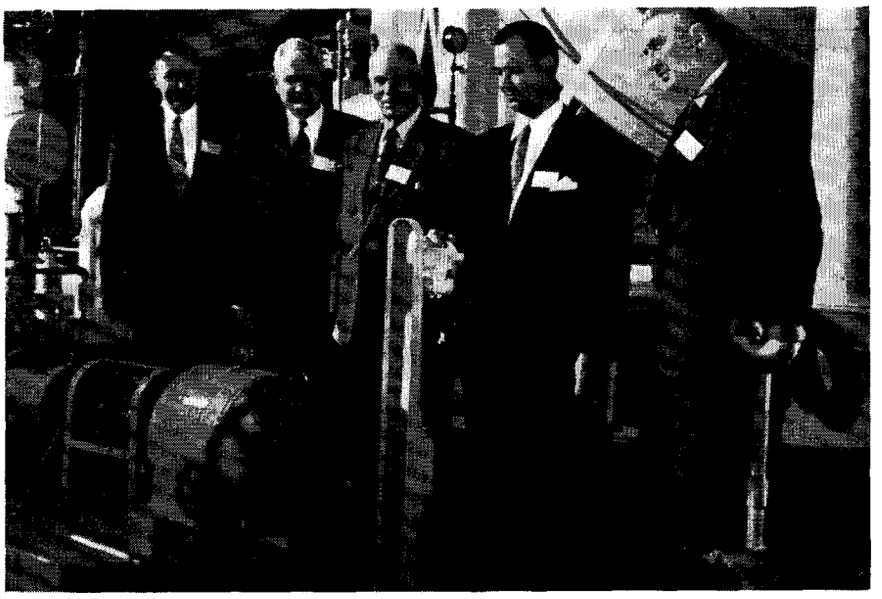
Shell Chemical completed its first ammonia plant in 1931 at Shell Point. By 1934, Shell agricultural specialists had a commercially successful method for direct application of ammonia as a fertilizer via irrigation water (Shell Nitrogation). To reduce seasonal fluctuation of ammonia use in the West (during winter rains there is no irrigation and, consequently, no Nitrogation), as well as to permit use of ammonia directly in nonirrigated areas, Shell Chemical began research in 1938 on application directly to the soil. It sponsored the first successful commercial use of this method (Shell Nitrojection) in 1941. Government restrictions during the war delayed further use until 1943, when both irrigation and direct application was resumed. Shell, unlike other ammonia manufacturers, sells its product "in the ground" via either Nitrogation or Nitrojection, maintaining an extensive group of distributors and dealers to perform the service for growers.

Today, 15% of all fertilizer nitrogen used in the U. S. goes into the soil as NH_3. In the West orchardists are the largest single group of users of ammonia, principally using the irrigation route. In all, some 250 crops in California alone are fertilized with direct application of ammonia. Despite early grower reluctance, each year per acre applications get higher. Record application is probably on sugar beets in California's San Joaquin Valley, where 450 pounds per acre are being used on an experimental basis.

Demand by western agriculture for ammonia has generally been ahead of supply. Shell Chemical's first ammonia plant underwent a series of "bottleneck

Merrill Gregory, *Country Gentleman;* William Q. Hull, AG AND FOOD associate editor; Richard L. Kenyon, AG AND FOOD managing editor; and F. H. Leavitt of Shell Chemical watch a demonstration of direct application of anhydrous ammonia to the soil near Ventura





F. D. Kuenzly, plant manager; C. W. Humphreys, vice president; Mayor Petit of Ventura, Calif.; and G. R. Monkhouse, vice president, watch R. C. McCurdy (second from right), president of Shell Chemical, turn the switch putting the new anhydrous ammonia plant into operation

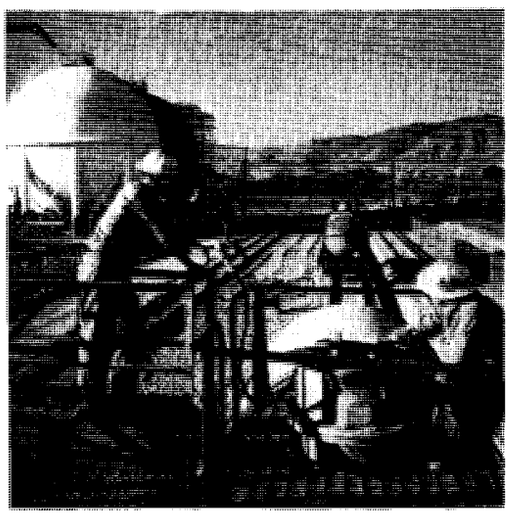
removals" to expand capacity until, in the words of C. W. Humphreys, Shell vice president, the "Shell Point plant became one big bottleneck." Shell recognized further expansion of ammonia could best be accomplished by building an entirely new plant, and it selected Ventura two years ago as the best site, based on readily available raw materials (Shell oil fields here have a plentiful supply of natural gas) and on an expanding adjacent market—southern California and Arizona agriculture. Part of Ventura's output will be used elsewhere by Shell to make ammonium sulfate, presently the largest single source of nitrogen for California growers.

Completion of the Ventura plant, upping Shell production to over 165,000 tons per year, brings operating West Coast ammonia plants to five. In addition to Shell at Shell Point, there are: Hercules, 36,000 tons per year at Pinole, Calif.; Hooker Electrochemical, 15,000 tons per year at Tacoma, Wash.; and Dow, 7000 tons per year at Pittsburg, Calif. When Brea Chemicals, Inc. (Union Oil subsidiary), completes its 73,000-ton-per-year plant at Brea, Calif., total West Coast ammonia capacity will be nearly 300,000 tons annually. (Not all of this, of course, is for fertilizer; nonfertilizer uses include refrigeration, petroleum refining, pulp and paper making, explosives, synthetic fibers. Nationally, about 70% of the ammonia produced is used by the fertilizer industry.)

Elsewhere in the West, the Salt Lake City area seems to be coming in for most attention from prospective ammonia producers. Salt Lake City Chemicals, formerly Mill Creek Chemical, and Utah Chemical have announced intentions to enter ammonia production in that area, but neither has started construction. Shell Chemical itself can double Ventura production by additions to the present plant. Present West Coast capacity plus future Shell expansion at Ventura will probably assure adequate West Coast ammonia fertilizer for several years. It appears logical that if and when another ammonia plant is built, it will be at the site of Shell Oil's Anacortes, Wash., petroleum refinery which is under construction with completion scheduled for 1955. Not only will the refinery be a ready source of hydrogen, but the expanding agriculture of the Pacific Northwest, sparked by reclamation projects of the area, should offer an excellent local market.

Shell expects that fertilizer ammonia prices may weaken in 1954, more likely in 1955. This it attributes to dropping farm income, general improvement in supply. Shell notes, however, that prices have remained remarkably steady for the past several years. Present cost per pound applied in California to irrigation water is 10.5 cents as compared to 9 cents prior to the war.

Loading an anhydrous ammonia tank car. Refrigerated sphere in the background holds enough ammonia to fill 100 tank cars



Herbicides Becoming More Useful Every Day

Evaluation of new chemicals continues in many experimental stations and industrial laboratories

KANSAS CITY.—Advances in the last few years have made some optimists speculate whether or not man could throw away the hoe in the never ending battle against weeds, said Byron T. Shaw, Agricultural Research Administration, USDA, at the First National Weed Control Conference held in conjunction with the 10th annual North Central Weed Control Conference here Dec. 8 to 10. The turning point in weed control came about 10 years ago when it was found that certain plant modifying chemicals, especially 2,4-D, could be used to kill weeds effectively. Chemicals have become well established supplemental tools for controlling weeds in the production of corn, wheat, oats, barley, rice, flax, sorghum, cotton, peanuts, sugar beets, and sugar cane. Each year about 25 million acres of small grains and corn are treated with 2,4-D alone; pastures and meadows are also receiving attention.

Translocation of CMU (chlorophenyldimethylurea) probably takes place in plants according to evidence gathered by J. R. Haun and J. H. Peterson, Du Pont. Their experiments, which were reported by their colleague, D. Wolf, consisted of adding carbon-14 ring-labeled CMU to a culture solution in which tomato plants were growing. By drying the plants and placing them in contact with x-ray film for a period of 22 days, radioautograms were produced showing the translocation of the radioactive carbon in the plant.

The investigators pointed out that their results demonstrate the pattern of