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Building a New Economy With Biotechnology

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Kannapolis, N.C.

When twin smokestacks at the former Cannon Mills factory imploded with a boom one foggy morning last summer, the hundreds of residents who gathered here to watch them fall were not just bidding the town's textile past goodbye.

They were welcoming its future.

After three years of dormancy, the 1.1-million-square-foot mill complex was being leveled to make way for an audacious undertaking in an unlikely location, a $1.5-billion biotechnology-research campus focused on food and nutrition.

The project, called the North Carolina Research Campus, is the brainchild of David H. Murdock, owner of Dole Foods and a onetime operator of the former textile mill that closed in 2003, leaving 4,800 people out of work. Six of the state's public universities and Duke University have signed on as major partners and will locate laboratories and researchers in Kannapolis, a city of 39,000 about 30 miles northeast of Charlotte. A separate development company owned by Mr. Murdock is recruiting private businesses.

If their ambitions are realized, Mr. Murdock and his university collaborators will have built a world-class science cluster in the heart of the South's dying textile belt. Community leaders in Kannapolis and its surrounding counties have embraced that vision, drawn by the prospect of as many as 5,500 biotechnology jobs on the research campus, as well as thousands of related positions.

"We've really gotten fired up," says Kannapolis's mayor, Robert S. Misenheimer, who likes to imagine the pathbreaking discoveries that could come out of campus's labs one day. "The sky's the limit."

Others, however, urge caution, noting that building a biotech hub is a risky venture and one that might not pay off for years, if ever. As greater numbers of civic leaders across the country look to higher-education institutions to create jobs and revitalize local economies, development experts worry that the expectation that university-generated research will lead to an economic renaissance may be overly idealistic, particularly in places like Kannapolis, where many adults have limited formal education.

Projects like the North Carolina Research Campus "are a good way to diversify your region and your economy," says Walter H. Plosila, vice president of the technology-partnership practice at Battelle Memorial Institute, a nonprofit research institute. "But, by themselves, they are not going to replace your steel industry or your textile industry."

A National Trend

Such admonitions, though, have done little to dampen the trend of looking to research, and, in particular, to biotechnology, to jump-start regional economies. Nationwide, state and local governments, universities, and private companies are spending millions of dollars to build new facilities and attract top-flight researchers.

Washington State started a $350-million Life Sciences Discovery Fund two years ago. Massachusetts's governor, Deval L. Patrick, has proposed capitalizing on strengths of its universities and academic medical centers by spending $1-billion over the next decade on biomedical research. In Florida, lawmakers have approved nearly $200-million over the past two years to attract top scientists to public colleges there and to start "centers of excellence" to foster stronger partnerships between higher education and the private sector.

North Carolina is no exception, despite the fact the state already accounts for 10 percent of biotech jobs nationwide. Three years ago, a bipartisan panel, led by two former governors, recommended more than doubling the state's biotechnology work force by 2013 and doubling it again over the following decade.

From the start, Mr. Murdock, an iconoclastic octogenarian, made it clear that he had no intention of taking it slowly. He has sworn off meat and is an outspoken advocate of the connection between healthy eating and well-being. He pledged to spend more than $1-billion to remake Kannapolis into an international center for nutrition research. He purchased expensive and advanced equipment, such as the world's most-powerful commercially available superconducting magnet, and upended convention by persuading the state's three major research universities, which are two hours' drive or more from Kannapolis, to become key collaborators. The state has pledged nearly $30-million a year, mainly to hire university research teams.

University leaders were drawn to Kannapolis by the "grand experiment," to see whether higher education, in partnership with the private sector, could intervene to "fundamentally transform" a local economy, says Leslie Boney, associate vice president of economic-development research, policy, and planning for the University of North Carolina.

Under President Erskine B. Bowles, a venture capitalist and former director of the federal Small Business Administration, the university system has made economic transformation a central part of its mission. That objective is playing out in different ways on different campuses and in different regions of the state, and the university has started a fund to award competitive grants to research projects that focus on local economic-development needs.

"The university's role used to be to come in and do a study and, in five years, we'd tell you why a plant closed," Mr. Boney says. "Now we have the opportunity, and the obligation, to help the state figure out what the new economy looks like."

Delivering Jobs

Richard K. Lester, director of the Industrial Performance Center at the Massachusetts Institute of Technology, agrees that universities can be drivers in regional and local economies. But at their core, he says, they are educational institutions, not employment factories.

"There is the real danger that expectations can exceed a university's ability to deliver," he says.

In Kannapolis and surrounding Cabarrus County, community leaders are looking to the research campus and its university partners to deliver jobs. After the Pillowtex Corporation, the final owner of the plant here, closed it in 2003, unemployment climbed to nearly 11 percent in the county. Since then, the region has continued to be buffeted by cutbacks and closings by local employers, such as Freightliner and Philip Morris. While most former Pillowtex employees have found new jobs, many are earning lower wages or must make lengthy commutes. Local officials worried that the area risked becoming just a bedroom community of Charlotte, without a core industry or corporate tax base of its own.

"It seems like our bedrock institutions have been falling like dominoes," says Robert W. Carruth, chairman of Cabarrus County's Board of Commissioners. Technology, he says, could be "a new foundation for our economy."

But some analysts who study the biotech industry warn that it can be a shaky foundation. Turning research into a commercially successful product can take good fortune and time to move through the regulatory process, says Joseph Cortright, who wrote a study on regional biotechnology centers for the Brookings Institution.

What's more, he notes, even successful biotechnology clusters typically produce relatively few jobs. No biotechnology company ranks among the 25 largest employers in the nine metropolitan areas in which the industry is concentrated.

For now, the universities plan to have fairly modest staffs on the research campus, where the first buildings are slated to open in the spring. North Carolina State will hire 13 tenure-track faculty members and about 50 support staff, while the University of North Carolina at Chapel Hill will begin advertising this fall for 18 faculty members in Kannapolis. The other universities will have a somewhat smaller presence on the campus.

Meanwhile, a handful of private employers, like the software company Red Hat, have signed on with the research campus, but for the most part, negotiations are still taking place and job numbers are unclear. Thus far, in fact, the campus's most significant employment effect has been through construction. About 400 workers are now erecting beams, pouring concrete, and installing high-tech wiring.

An economic-impact study commissioned by Kannapolis's city council projects that 2,220 jobs could be created on the research campus when it opens next year and as many as 5,535 could be created by 2013. The study estimates that 37,450 jobs, about a third of which would be in biotechnology, could be created in the area over the next 25 years.

But the study also points out that few Kannapolis residents are likely to qualify for many of the high-tech, and high-paying, jobs at the research campus. Only 14 percent of Kannapolis's adults have bachelor's degrees, and nearly one-third are without high-school diplomas. "On some level, there is a disconnect between the old economy and the new economy," says Mr. Boney, who leads the University of North Carolina's economic-development efforts, "and in the short term, that could be painful for people in the community."

Clyde Higgs, who is in charge of recruiting private business to the research campus for Mr. Murdock's development company, Castle & Cooke, says the campus's supporters harbor no illusions that such changes will happen overnight. "We are trying to create an ecosystem of smart people and smart organizations," Mr. Higgs says. "That takes time."

Perceptions and Preparation

If the area's work force does make that transition, a great deal of the credit should go to five people who work out of a storefront office on Dale Earnhardt Boulevard, which is named for the late Nascar star who is Kannapolis's most famous citizen. They are members of Rowan-Cabarrus Community College's fledgling biotechnology faculty.

The community-college program, which is being built from scratch, will prepare students to become laboratory technicians and workers in biomanufacturing plants that will eventually make the products generated by the campus's research. The program's dean, R. Edward Otto Jr., has become something of a

biotech evangelist in the community, where he tells high-school guidance counselors, Rotary-club members, and anyone else who will listen that 60 percent of the jobs created by the research campus won't require a bachelor's degree.

"People think all the jobs will be for Ph.D.'s in lab coats," Mr. Otto says. "I try to break those perceptions."

There is some evidence his message is getting out. Keri Allman-Young, director of Rowan-Cabarrus's career-development center, which shares space with the biotechnology program, says more of her clients have expressed interest in "working over there" on the campus, especially since the skeletons of the first buildings have gone up. Some 70 students have enrolled in Rowan-Cabarrus's introductory biotechnology course, "BioWork," since the community college began offering it a year ago.

Jody Lublanezki, the course's instructor, says he teaches a mix of students, including those with nursing or medical backgrounds and one man who hoped to win a maintenance contract at the research campus and didn't want biotechnology to "sound like Greek to him."

Roy Hanschu, who was laid off in March from his job as a painter at Freightliner, says he enjoyed "BioWork," which mixes basic principles of biotechnology with simple experiments like making soap, enough to want to pursue a career in the field. Because Rowan-Cabarrus's degree program probably won't be accredited until 2009, he will have to complete much of his course work at one of two neighboring community colleges.

First, though, Mr. Hanschu, who is 32, has to find a job so that he can afford to go to college. His unemployment benefits run out in October.

"I'm definitely going on. This is not a stopping point for me," Mr. Hanschu said as he wrapped up the class in August. "I think biotech is something that's going to be around for a long time."

That sense of stability also appeals to Beverly Osborne, who worked at the textile mill for 24 years and recently learned that she may have to relocate to Richmond, Va., or lose her job of six years at Philip Morris. An assessment of her job skills and work-style preferences that she took at Rowan-Cabarrus's career center suggested she might be suited to working as a cosmetologist or a head of housekeeping, but she is worried that those positions could disappear with the next downturn.

With biotechnology, "I know there will be a job there, at least until I retire," says Ms. Osborne, who is 50. "Since I've been through this twice, I want something that will last."

A Cultural Shift

Still, community leaders say that a small number of former workers, particularly old timers, are holding out for the next textile job. They think the founder of Cannon Mills is "going to rise from the grave and reopen the plant," says John S. Cox, president of the Cabarrus Regional Chamber of Commerce. "That's just never going to happen."

Part of the challenge, Mr. Cox and others say, is changing a culture. Kannapolis was such a company town, according to a local historian, Norris Dearmon, that select mill employees were excused from their shift to form a fire brigade when a blaze broke out, and workers would "just call the company" if a faucet leaked in their homes.

But a year after demolition crews detonated the plant that occupied the heart of town, attitudes may be changing. If construction goes according to plan, the 350-acre research campus will eventually form something like a town center, with retail shops, municipal buildings, and even a movie theater mixed in with the laboratory facilities.

Already, one new restaurant has opened in the downtown area adjacent to the campus, which is known as Cannon Village. Since July, David A. DePompa and his wife, Debbie, have been serving homey sandwiches, heart-healthy salads, and take-away frozen entrees to the small cadre of university administrators and biotech-company employees who are working out of the storefronts that line the otherwise-idle village streets. The couple is betting that DePompa's Comfortable Foods will be a hit with the new workers the campus is slated to bring.

"With the research campus coming in," Debbie DePompa says, Kannapolis is "just going to do nothing but grow."

NEW RESEARCH PARK'S PARTNERS

Duke University and six campuses of the University of North Carolina will conduct research on the North Carolina Research Campus, in Kannapolis.

U. of North Carolina at Chapel Hill

Chapel Hill's Nutrition Research Institute will focus on using cutting-edge biotechnology to help understand why people have differences in metabolism and nutrient requirements. The research could offer new opportunities to personalize dietary requirements to prevent problems like cancer and obesity.

North Carolina State U.

The university's Institute for Fruit and Vegetable Science will be the first institute dedicated to the use of genomics, bioinformatics, and systems biology to enhance plant breeding. N.C. State, in conjunction with North Carolina A&T State University and Dole Foods, will focus on ways to enhance the nutritional content of fruits and vegetables, increase agriculture production, and develop new plant varieties.

Duke U.

Duke will manage the research campus's new 311,000-square-foot core laboratory, which will house state-of-the-art equipment and facilities to be used by all universities and companies on the research campus. The university will also focus on accelerating the movement of therapies from the lab to patients and will conduct a new, long-term study that seeks a deeper biological understanding of common diseases.

North Carolina A&T State U.

The historically black university will focus on improving the quality and safety of food once it has left the farm. Its research will be in areas such as isolating health-promoting food components in fruits and vegetables and developing new and effective methods to prevent spoilage. That work will provide a link between N.C. State's work on nutritionally enhanced produce and Chapel Hill's efforts to use specific nutrients for certain health applications.

North Carolina Central U.

One of the university's research projects will assess the impact of food additives on developing organs and tissues by injecting them into zebra-fish eggs and observing what happens to the adult fish. Another would try to identify dietary compounds that can help bolster the immune system, slow down the aging process, or prevent certain diseases.

U. of North Carolina at Charlotte

The Charlotte campus will run a bioinformatics core facility, which will develop methods and tools to analyze the complex information that emerges from work at the research campus. Charlotte faculty members will collaborate with researchers at other institutions to manage and interpret data and to translate the results into practical benefits for human health.

U. of North Carolina at Greensboro

The Greensboro campus will examine the molecular and cellular mechanisms of nutrition and the interplay between bioactive food components, or biomolecules that modulate metabolism and affect health, and genetics. Scientists will study the nutritional components of certain foods, such as the antioxidant properties of anthocyanins, the source of color in some berries, as part an effort to develop healthier diets and to combat obesity and disease.

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