Changes: The Evolution of the Chemicals Industry in the U.K.

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Rumors of the demise of the U.K. chemicals industry are greatly exaggerated.

Ask Jane or John Q. Public — Joe Bloggs, as the Brits would call him — about the state of the chemicals industry in the United Kingdom, and you'll probably get a response along the lines of "There's not much left of it. It's all gone to China and who knows where else. We don't produce anything in this country any more."

That view is not only discouraging and depressing — it is also quite wrong. As Britain's famed rock star David Bowie noted in his 1972 song, time inevitably brings changes — and you have to turn and face the strange.

In 2010, chemical production in the U.K. totalled US$93.5 billion, according to the American Chemistry Council's Global Business of Chemistry report *(1)*, making the U.K.'s chemicals industry the tenth-largest in the world (although, in fairness, two years earlier it ranked eighth). The commodity chemicals company Ineos, which has most of its operations in the U.K., is the world's ninth-largest producer of chemicals based on sales.

However, Ineos aside, it is true that many of the U.K.'s chemicals production plants are today owned by non-U.K. companies — which is probably where Joe Bloggs gets his mistaken views.

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Early development of the industry

The history of the U.K.'s chemicals industry begins in the early 19th century, driven by demand for acids, alkalis, soaps, and dyestuffs. Indeed, the first aniline dye was discovered in the U.K. by William Perkin in 1856. Known as mauveine and produced from coal tar, it was a synthetic alternative to the very rare and extremely expensive natural purple (*i.e.*, mauve) dyes available at the time. Other synthetic dyes in a range of colors followed, and with them a fledgling dyestuffs industry in the north of England, supplying the country's textiles centers in Lancashire and Yorkshire.

The alkali industry established itself during the 19th century near salt deposits at Teesside in the northeast of England, and at Runcorn in the northwest. Both locations benefited from already-well-established links to the main bases for textile and heavy industry, such as Newcastle, Liverpool, Manchester, and Leeds, as well as ports.

At Port Sunlight, near Runcorn, Lever Brothers in 1887 began construction of a huge site to produce soaps and detergents from alkalis and vegetable oils. After its 1929 merger with the Margarine Union, the company changed its name to the better-known Unilever.

Earlier, in Scotland, the outbreak of World War I drove the production of explosives by Nobel Industries at Ardeer, while from the mid-1960s onward, the nascent North Sea

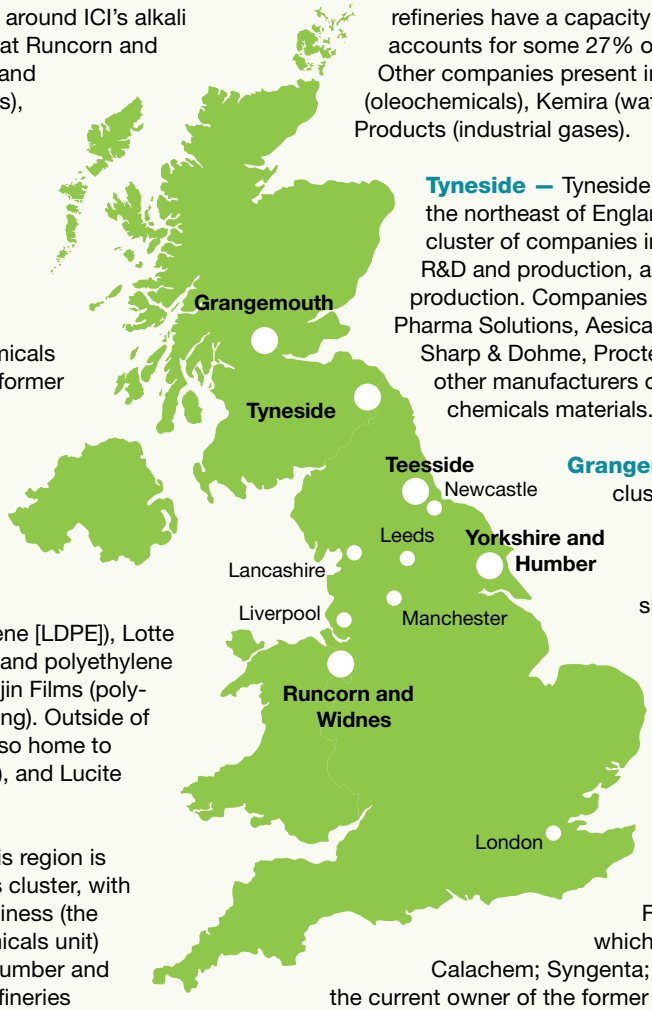
The U.K.'s Chemical Industry Clusters

The U.K.'s chemicals industry today is still largely concentrated in five regional hubs: Northwest England, around Runcorn; Northeast England (Teesside); Yorkshire and Humber; Tyneside; and Grangemouth in Scotland.

Runcorn and Widnes — Built around ICI's alkali operations, today's companies at Runcorn and Widnes include Ineos (chlorine and vinyls), Solvay, Victrex (polymers), and AGC Chemical (fluoropolymers). The region is both the largest and most diverse of the U.K.'s chemicals clusters, employing around 50,000 people at 500 separate sites and companies.

Teesside — The Teesside chemicals cluster is based around a huge former ICI site at Wilton. Owned by the Singaporean company SembCorp Utilities, which provides the site's infrastructure and services, the main players at the site are Huntsman (polyurethanes), SABIC (petrochemicals and aromatics, including low-density polyethylene [LDPE]), Lotte (purified terephthalic acid [PTA] and polyethylene terephthalate [PET]), DuPont Teijin Films (polyester films), and Ensus (biorefining). Outside of Wilton, the Teesside region is also home to GrowHow (fertilizers), SSI (steel), and Lucite International (acrylics).

Yorkshire and Humber — This region is home to a huge petrochemicals cluster, with BP's aromatics and acetyls business (the company's last remaining chemicals unit) on the north bank of the river Humber and the ConocoPhillips and Total refineries on the south side. Between them, the two refineries have a capacity of 421,000 bbl/d, which accounts for some 27% of the U.K.'s refining capacity. Other companies present in the region include Croda (oleochemicals), Kemira (water treatment), and Air Products (industrial gases).



Tyneside — Tyneside and Northumberland in the northeast of England are home to a dynamic cluster of companies involved in pharmaceuticals R&D and production, as well as speciality chemicals production. Companies in the area include Shasun Pharma Solutions, Aesica, Nicolas Piramal, Merck Sharp & Dohme, Procter and Gamble, and several other manufacturers of biotech and speciality chemicals materials.

Grangemouth — The Grangemouth cluster has grown up around what used to be the BP petrochemicals site and refinery (now the main U.K. site for Ineos) and Scottish Dyes (later acquired by ICI). The 200,000-bbl/d refinery feeds a 2 million ton/yr petrochemicals site that produces 330,000 ton/yr of linear low-density polyethylene (LLDPE) and 235,000 ton/yr of polypropylene. Other main companies at the site are Fujifilm Imaging Colorants, which bought ICI's dyes plant; Calachem; Syngenta; and Germany's Aurelius, the current owner of the former ICI fine-chemicals plant at the site.

oil industry drove the creation of a vibrant oilfield services industry in Aberdeen. Aberdeen remains the hub of the U.K.'s oil industry to this day, with a vast array of exploration, production, engineering, and oilfield services companies based in and around the city.

The rise of ICI

Much of the history of the U.K. chemicals industry can be pegged to the rise and fall of the national chemicals champion, Imperial Chemical Industries (ICI). ICI was formed in 1926 through the merger of Brunner Mond (an early producer of soda ash, which today lives on as Tata Chemicals Europe), United Alkali, British Dyestuffs, and Nobel Industries.

With 33,000 employees at the time of the merger in 1926, ICI was a bellwether of British industry from the start. The company initially focused on chemicals, explosives, fertilizers, insecticides, dyestuffs, and paints, but significant spending on R&D and support for fundamental, blue-sky research soon enabled it to develop new products.

A key moment was the discovery of industrially practical polyethylene (PE) synthesis at the ICI plant in

A real success story for the U.K. today is its vibrant pharmaceuticals industry.

Northwich, which was an unexpected result of a research program into high-pressure reactions during the 1930s. Developing the product and scaling up the process took a few years, but by 1939 ICI had the world's first commercial reactor producing PE up and running, and had set the foundations for a successful polymers division.

A few years later, ICI's Board of Directors decided to venture into pharmaceuticals. It was a bold decision, considering that this would be an entirely new area for ICI. It also took a lot of patience, especially by today's standards — it was 20 years before ICI's pharmaceuticals division broke even. But break even it did, with products such as the breast cancer treatment Tamoxifen, the beta-blocker Inderal, and the heart disease treatment Tenormin. By the 1980s, ICI was the backbone of the U.K.'s industry. In 1984, ICI became the first company in the U.K. to make more than £1billion (US$1.6 billion) in pretax profits, with a diverse business spanning polymers and paints, pharmaceuticals, and agrochemicals.

Declining fortunes

ICI's fortunes turned in 1991. While the company was able to fight off an attempted takeover by the conglomerate Hanson — which saw ICI's relatively low share price as an opportunity too good to pass up — ICI's Board was, nevertheless, shaken. In line with the business mantra of the time, the company's leadership decided to break up ICI's diversified structure and focus on what it perceived to be its core businesses, *i.e.*, paints and coatings and bulk chemicals, including chloralkalis, polyester chemicals, and explosives. The pharmaceuticals division was spun off to form Zeneca (which in 1999 merged with Sweden's Astra), and the pesticides business was spun off as Syngenta. A few years later, the core business was no longer core either, as the management of the day decided to exit the cyclical bulk chemicals sector and buy into the then-fashionable speciality chemicals industry by acquiring the chemicals businesses of Unilever.

"The execution [of that deal] was disastrous," according to Alan Eastwood, economic analyst with the U.K.'s Chemical Industries Association (CIA). "ICI bought first at the height of the market, took on debt, and was then a forced seller after markets turned" in the late 1990s.

Selling off the bulk chemicals business took five years and 50 separate deals and still left ICI with enormous debts — effectively precluding the acquisition of what remained of the company by Akzo Nobel in 2008. Significantly — and unhappily, for the U.K. chemicals industry — the piecemeal sale fragmented the ownership of its large sites and undermined their integration, which had been one of the organization's original advantages.

Other chemicals and the birth of Ineos

ICI may have dominated the industry, but for many years Shell and BP also had significant bulk chemicals businesses in the U.K. BP produced a broad range of olefins, derivatives, and petrochemicals, starting with the creation of a joint venture with Distillers Co. in Grangemouth in 1947, but it sold most of those product lines to a new arrival, Ineos, in 2005. The £9 billion (approximately US$16 billion in 2005 dollars) transaction transformed Ineos into a huge petrochemicals player.

Founded in 1998, Ineos was formed through a raft of acquisitions, including BP's Antwerp, Belgium, site, which primarily produces ethylene oxide and ethylene glycol; the speciality chemicals business Crosfield, which produces ingredients for detergents and toothpastes; Dow Chemicals'

▲ The Wilton chemicals complex is situated along the banks of the River Tees. This former ICI chemicals production site is the hub of chemical industry activity in the Teesside region, and is now home to a broad range of companies producing mainly polymers, bulk chemicals and biofuels. Photo courtesy of *tce*.

global ethanolamine and gas-treating amines businesses; the vinyl chemicals producer EVC; and Germany's Phenolchemie. In the U.K., Ineos also acquired ICI's chloro- and fluorochemicals businesses, along with a selection of other bulk chemicals businesses across Europe.

Meanwhile, Shell disposed of most of its U.K. chemicals businesses over the years, in order to concentrate continuing activities at larger, more competitive sites and focus on growing its activities in Asia and the Middle East. The company's polyolefins unit was first merged with that of BASF to form Basell, a major producer of polypropylene, polyethylene, and advanced polyolefins. That business was later bought by the venture capital group Access Industries, and in 2007 it merged with the U.S.-based Lyondell.

In recent decades, the U.K. has built a significant position in speciality chemicals, with companies such as Croda (personal care chemicals and oleochemicals), Johnson Matthey (catalysts), Elementis (additives), and Yule Catto (polymer chemicals). ICI's former agrochemicals business, Syngenta, still has several sites in the country, although its headquarters moved to Switzerland following a merger with Novartis' agrochemicals unit in 2000.

Pharmaceuticals success

A real success story for the U.K. is its vibrant pharmaceuticals industry. Two of the world's top-ten drug companies have their headquarters in the U.K. — GlaxoSmithKline and AstraZeneca — and nearly all of the world's other leading pharma companies have sites in the country, predominantly for R&D. In this, they take advantage of the U.K.'s enviable track record in research and innovation. According to government figures *(2)*, the U.K. ranked third in terms of global pharmaceuticals R&D spending in 2007, behind the U.S. and Japan. "The U.K. industry has discovered and developed more leading medicines than any other country apart from the United States, and as much as the rest of Europe," the U.K. government said at the time, adding that "some 15 of the world's current 75 best-selling drugs were discovered and developed in Britain" *(3)*.

A key to this R&D success was access to the country's renowned universities, including the Univ. of Oxford, the Univ. of Cambridge, Imperial College, Manchester Univ., and University College London.

Yet, in more recent years, the sector has suffered not just with the global economic slowdown but also with the rising costs of developing new pharmaceuticals and competition from producers of generic drugs. Several pharmaceuticals companies announced the closure of R&D facilities — most notably AstraZeneca's laboratories at Loughborough in the Midlands in 2010, and Pfizer's location in Sandwich, Kent, one year later.

Nevertheless, the U.K. remains the world's third-largest direct exporter of pharmaceuticals. The U.K.'s pharmaceuticals industry employs more than 80,000 people directly, and many more indirectly. It accounts for 10% of world pharmaceutical R&D expenditures and 40% of all industrial R&D spending in the U.K. — making pharmaceuticals the country's third most-profitable economic activity, after tourism and finance.

Diverse ownership

The turbulent history of the U.K.'s home-grown chemicals giants has resulted in a significant number of mergers and acquisitions over the past 20 years. Many of the companies that used to be household names or spin-off companies from the industry majors have come and gone, including Laporte, Inspec, Avecia, Acordis, BTP, Ascot, Allied Colloids, Albright and Wilson, BOC, and many more. However, the manufacturing sites are still largely there — only the name on the door has changed. Today, those doors bear such names as SABIC, Huntsman, Valero, Polimeri, Degussa, Linde, Lonza, Essar, Lucite, BASF, Rhodia, Rockwood, Tata, Fujifilm, or Aurelius instead. In total, more than 3,000 chemical companies have a presence in the U.K.

So, the next time a Joe Bloggs — or John Q. — bemoans the demise of ICI and complains that the U.K. chemicals industry is in an inexorable decline "because we don't produce anything anymore," do feel free to cure him of his ignorance. CEP

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