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Oligopoly, Inc. 2005

Concentration in Corporate Power

PHARMA: The top 10 companies control almost 59% market share of the world's leading 98 drug firms.
ANIMAL PHARMA: The top 10 companies control 55% of the $20,255 million world veterinary pharmaceutical market.
BIOTECHNOLOGY: The top 10 publicly-traded biotech companies account for almost three-quarters of the global biotech market.
SEEDS: The top 10 companies control almost half of the $21,000 million commercial seed market. ETC Group's 2005 report on seed industry consolidation is available here: http://www.etcgroup.org/article.asp?newsid=524
PESTICIDES: The top 10 firms control 84% of the $29,566 million global pesticide market. Analysts predict only three major companies will survive in the conventional pesticide business by 2015.
FOOD RETAIL: In 2004, the top 10 global food retailers accounted for combined sales of $84,000 million – 24% of the estimated $3.5 trillion global market.
FOOD & BEVERAGE PROCESSING: The top 10 companies accounted for 24% of the estimated $1.25 trillion global market for packaged foods. The top 10 companies account for 36% of the revenues earned by the world's top 100 food and beverage companies.
NANOTECH: Industry and governments invested more than $10,000 million in nanotechnology R&D in 2004.

The Context: It's no secret that transnational corporations wield unprecedented power to shape social, economic and trade policies. Today we are witnessing ever more concentrated control over – not only the food system – but the products and processes of life and the fundamental building blocks of nature.

At the beginning of this decade, many analysts assumed that the hectic pace of corporate mergers seen in the '90s was over and never likely to be repeated. One reason for this assumption was that corporate size (and market share) had ballooned to a scale that even notoriously myopic regulators could no longer ignore. Secondly, of course, the dot.com bubble burst brutally, dampening investor confidence and the enthusiasm of venture capitalists to bankroll either new technologies or takeovers. Beginning in 2004, bubble concerns abated as more and bigger mergers were announced. In 2004, the global value of corporate mergers and acquisitions climbed to $1.95 trillion – a 40% jump over the $1.38 trillion in 2003. Combined sales of the world's 200 largest corporations account for 29% of world economic activity in 2004,[1] Due to intra-firm trade, however, what looks like buying and selling between countries is very often the redistribution of capital among subsidiaries of the same parent multinational corporation. The lightning flash of globalization has blinkered regulators anxious that their home-headquartered multinationals be competitive. Often overlooked is market dominance through intellectual property manipulation (such as recycling innovations to extend patent monopoly) and technology trading leading to global technology cartels.

As always, corporate dominance is mirrored by growing disparities between rich and poor, both within and between OECD nations and the South. The following are just a few indicators:

- Mainstream economists preach that capital always seeks the highest returns and typically flows from rich countries to poor ones – but *The Economist* notes that emerging economies sent about $350 billion to rich countries in 2004.[2]
- The 400 richest people in America are collectively worth $1.13 trillion – more than twice the GDP of Brazil.[3]
- America's corporate executives now make more in a day than the average US worker makes in a year. In 2004, the median compensation of American CEOs increased 30%, to $6 million.[4]

Oligopoly Inc. 2005 reveals that corporate concentration – not only in food and agriculture, but in all sectors related to the products and processes of life – has increased remarkably since our last review two years ago. Since ETC's 2003 report, the world's top 10 seed companies have increased their control from one-third to one-half of the global seed trade and the top 10 biotech enterprises have raised their share from just over half to nearly three-quarters of world sales in that sector. The market share of the top 10 pesticide manufacturers rose modestly, from 80 to 84%, but industry analysts predict that only three companies will survive the next decade. If such rapid concentration among the agricultural input companies is alarming, the control exercised by the world's leading 10 food processors and the top 10 food retailers is staggering. In each category, in markets that should – almost by definition – be highly diversified, the dominant companies now control a quarter of their multi-trillion dollar markets. As the "input-ers" and the "output-ers" battle for survival and supremacy, our new report shows that a subterranean struggle is underway at the nano-scale to control the fundamental building blocks of life and nature. Corporate investment in nanobiotechnology (or, synthetic biology) could give ultimate control to a very different set of corporate actors.

Pharmaceutical Industry

Top 10 Pharmaceutical Companies by Sales, 2004

Company	Pharma Sales 2004 (US$ millions)	Company Profit / Rank 2004 (US$ millions)	Rank by Profit (2004)
1. Pfizer	46,133	11,361	1
2. GlaxoSmithKline	32,853	8,095	4
3. Sanofi-Aventis	32,208	10,122	2[5]
4. Johnson & Johnson	22,128	8,509	3
5. Merck & Co.	21,494	5,813	5
6. AstraZeneca	21,426	3,813	8
7. F. Hoffman-La Roche	19,115	5,344	7
8. Novartis	18,497	5,767	6
9. Bristol-Meyers Squibb	15,482	2,381	9
10. Wyeth	13,964	1,234	10
Total	**243,300**	**62,439**	

Source: *Scrip's Pharmaceutical League Tables 2005* provided by PJB Publications; company profit data (not necessarily limited to pharma sales) from *2005 Fortune Global 500*. (See endnote 5.)

The 98 drug companies tracked by *Scrip's Pharmaceutical League Tables 2005* had combined sales of $415 billion in 2004.[6] The top 10 companies account for almost 59% of the total. The 2003 merger of Pfizer and Pharmacia spawned the world's largest pharmaceutical company. Today Pfizer dominates the pack in both sales and profits. Consolidation continued in 2004 with the takeover of Aventis by Sanofi-Synthelabo, creating the world's third largest drug company, Sanofi-Aventis.

> "Instead of being an engine of innovation, it is a vast marketing machine. Instead of being a free market success story, it lives off government-funded research and monopoly rights." – Marcia Angell, *The Truth About the Drug Companies*, p. 20.

Big Pharma Under Siege: Patent protection woes and a sluggish drug pipeline – with no apparent blockbusters in the works – continue to plague big pharma.[7] In 2004 the industry's image further deteriorated due to drug recalls and regulatory scandals. Merck was forced to recall its $2.5 billion blockbuster, anti-inflammatory drug Vioxx, after it was found to cause heart attacks and strokes. The company faces over 7,000 Vioxx-related lawsuits, and liability estimates vary wildly – from $5 billion to as much as $50 billion.[8] Merck expects revenues to plummet an additional $2 billion when its best-

selling drug, Zocor (the world's second largest selling drug – accounting for 20% of Merck's sales) comes off-patent in June 2006. In late November 2005 Merck announced that it would cut 7,000 jobs and close 5 (of 31) manufacturing plants.[9]

"The past quarter-century has seen the emergence of a vast medical-industrial complex, in which doctors, hospitals and research institutions have deep financial links with drug companies and equipment makers. Conflicts of interest aren't the exception – they're the norm." – Paul Krugman, *New York Times*, December 16, 2005

The pharma sector as a whole still posts healthy profits – more than $6 billion in 2004. Out of 51 industries tracked by *Fortune*, the pharma industry ranked third in profits (only banking and petroleum refining were more profitable).[10] Despite big pharma's systemic ills, drug companies are using a number of tactics to keep profits high. For example:

- In the US, the pharmaceutical and health products industry spends more on lobbying than any other industry. Only the insurance industry spends more on lobbying and campaign contributions combined.[11] In 2004, pharmaceutical companies spent a record $123 million on lobbyists; 52% of the lobbyists (more than 670 people) were formerly employed as federal officials.[12]

- Pharmaceutical companies spend more on legal services than any other sector – most of it to ward off rivals wanting to produce generic versions of the biggest selling drugs. One patent attorney estimates that, in a routine year, about 70% of a major pharmaceutical company's global legal expenditure will go toward patent litigation.[13]

- A recent investigation by the journal *Nature* reveals that panels of experts who write clinical guidelines – used by physicians to determine diagnosis and treatment – have extensive financial ties to the pharmaceutical industry.[14] Public-health experts find these conflicts especially disturbing because the guidelines are specifically written to directly influence which drugs doctors prescribe. The *Nature* study considered more than 200 guidelines from around the world. Not all of the guideline-producing panels disclosed details on individual authors; in the cases where information was provided:
  - Half of the panels had at least one author with a conflicting advisory position in the pharmaceutical industry.
  - More than a third of the panels included at least one member who gave seminars on behalf of a "relevant drug company."
  - In one case, every member of the panel had been paid by the pharmaceutical company responsible for the drug that the panel ultimately recommended.

Wonder why? "Is the public more cynical? Yes…There's a perception that we don't bring much to the party." – John LaMattina, Pfizer's president of global research.[15]

Animal Pharmaceutical Industry

Top 10 Animal Pharmaceutical Companies, based on 2004 sales

Company	2004 sales US$ (million)
1. Pfizer	1,953
2. Merial	1,836
3. Intervet	1,272
4. DSM	1,068
5. Bayer	976
6. BASF	901
7. Fort Dodge	837
8. Elanco	799
9. Schering-Plough	770
10. Novartis	756

Source: Animal Pharm Reports, 2005.

According to *Animal Pharm Reports*, global sales of animal pharmaceuticals and nutrition reached $20,255 million in 2004 – a 6.5% gain from the previous year. (The animal pharma market includes veterinary pharmaceuticals, vaccines and other biologicals, medicinal and nutritional feed additives).

The top 10 animal pharma companies account for 55% of the sector's 2004 global sales. The top 20 companies control 75% of the global market. Products for food animals (cattle, pigs, poultry) account for almost two-thirds of global sales in this

sector, but the "companion animal" (pets) market has led the industry's growth over the past decade, accounting for 36% of global animal pharma sales in 2004. Robust growth in companion animal product sales (over 6% per annum since 1991) almost matches growth in the human health care sector.[16]

Because of the strong emotional bonds between people and their pets, industry analysts note that there is "a high economic ceiling" for spending on companion animal products. Trends in animal health are mirroring trends in human health care – including more emphasis on geriatric diseases (drugs to treat canine arthritis and congestive heart failure) as well as drugs for canine cognitive dysfunction ("doggie Alzheimer's" as one website puts it). *Animal Pharm* forecasts that companion animal market sales will increase from $4.5 billion in 2003 to $5.9 billion by the end of the decade.

By contrast, the outlook for medical feed additives is not bright. Although some industry trade groups reject the findings, a growing body of scientific evidence shows that the routine feeding of antibiotics to farm animals promotes development of antibiotic-resistant bacteria that can be transferred to people, making it harder to treat bacterial infections in humans. By the end of 2005, the EU requires that all remaining antibiotic growth promoters be withdrawn from sales in the EU. In response to mounting public concern over the dangers of antibiotic overuse, several restaurant chains (including McDonald's) have announced policies to prohibit their poultry suppliers from routine use of antibiotics important in human medicine as growth promoters. The Union of Concerned Scientists estimates that 70 percent of the antibiotics used in the US is used as feed additives for chicken, hogs and beef cattle – not to treat illness – but to promote faster growth and to compensate for the shortcomings of confinement operations.[17]

The livestock and poultry industries are extremely vulnerable to catastrophic shutdown and economic loss due to fast-spreading diseases. The looming spectre of mad cow disease (bovine spongiform encephalopathy) is now overshadowed by dire warnings of an avian influenza pandemic in birds and humans. Avian flu can spread through human contact with birds, but public health experts warn that if the virus mutates into a form that is highly infectious for humans and spreads easily from person to person, it will set off a global flu pandemic.

Outbreaks of a highly pathogenic strain of Avian influenza (the H5N1 virus) began in mid-2003 in Southeast Asia where the virus is now considered endemic (parts of Indonesia, Vietnam, Cambodia, China, Thailand and possibly Laos), having caused 70 human deaths by December 2005. Outbreaks of the avian flu have also been reported in Russia and Eastern Europe. According to WHO, "Never before in the history of this disease have so many countries been simultaneously affected, resulting in the loss of so many birds."[18] Millions of birds in commercial poultry flocks are being culled or vaccinated to eliminate the virus and control its spread. The globalization and intensification of industrial poultry operations have sped up the evolution of avian influenza.[19]

Biotechnology

Top 10 public biotech companies,* 2004

Company	2004 Revenue (US$ millions)	% change from 2003
1. Amgen	10,550	26%
2. Monsanto	5,457	62%
3. Genentech	4,621	40%
4. Serono (Switz.)	2,458	22%
5. Biogen Idec	2,212	226%
6. Genzyme	2,201	28%
7. Applied Biosystems	1,741	3%
8. Chiron	1,723	-2%
9. Gilead Sciences	1,325	53%
10. Medimmune	1,141	8%

Source: Based on data provided in *Nature Biotechnology*, June 2005

* *Nature Biotechnology* defines biotech companies as "those companies whose primary commercial activity depends on the application of biological organisms, systems or processes, or on providing special services that draw on biological systems." (Pharmaceutical firms and medical device companies are not included.)

Based on *Nature Biotechnology's* annual survey, the top 10 publicly-traded biotech companies represented less than 3% of the total number of companies in the biotech sector but accounted for 72% of the entire sector's revenues ($33,429 million in revenues out of the total $46,533 million for 309 companies). In other words, a few biotech companies are prospering – the vast majority is losing money, and the public biotech sector as a whole is in the red – with combined losses of $4,160

million ($4.16 billion) in 2004. The 309 publicly traded biotech companies spent $16,000 million on R&D in 2004, with the top 10 companies accounted for only 14%of the total.[20]

Coming of Age? The biotech industry traces its origins to the founding of Genentech on April 7, 1976 – the first genetic engineering company. Here's how industry analysts at Ernst & Young describe biotech's evolution: "On the cusp of its 30th birthday this is an industry that is coming of age, emerging from the volatility of a teenager and the uncertainty of early adulthood, to the maturity, focus, and rationality of an accomplished adult."[21] The analysts might have added that in its quest to reach adulthood, the vast majority of biotech companies have died off – only the fittest have survived and thrived.

Three-quarters of the 309 public biotech companies surveyed were US-based, 15% in Europe, 8% in Canada. The vast majority (82%) are devoted to the human health sector, 14% are service providers (offering research and technology services such as functional genomics or high-throughput screening). Agbiotech represents only 3% of the total.

Fledgling biotech companies can raise capital by partnering with big pharma for research and/or licensing deals, or through the sale of public stock in the company. In 2004, 50 biotech companies made initial public offerings generating nearly $2,500 million in funds.

Pipeline clogging, regulations looming, generics threatening: In 2004, only six biotech drug candidates were approved by US Food & Drug Administration, far below the average of 12 approvals per annum in recent years. Drug development time is getting longer for biologicals – increasing to an average 7 years or more. Meanwhile, patents on blockbuster biotech drugs will expire soon, and companies are worried about the impact. "If generic versions of biotech drugs flood the market, the profits from brand drugs of the large cap biotechs are likely to plummet," warn industry analysts.[22]

Biotech's Top 10 Blockbusters 2004: Bestselling Genetically Modified Drug Products

Product/Company	2004 sales $US millions	Therapeutic use
Procrit/Johnson & Johnson	$3,589	Red blood cell stimulant
Rituxan/Genentech	$2,963	Non-Hodgkin's lymphoma
Remicade/Johnson & Johnson (Centocor)	$2,891	Non-Hodgkin's lymphoma
Epogen/Amgen	$2,600	Kidney failure
Enbrel/Amgen	$2,580	Arthritis
Aranesp/Amgen	$2,500	Kidney disease
Epogin-NeoRecormon/Roche	$1,826	Red blood cell booster
Neulasta/Amgen	$1,700	White blood cell booster
Avonex/ Biogen	$1,417	Multiple sclerosis
Pegasys-Copegus/ Hoffmann-La Roche	$1,370	Hepatitis C infection

Source: ETC Group, based on sales figures compiled by *Signals Magazine*, 3/17/2005 www.signalsmag.com

Commercial Seed Industry

A Note on the Seed Industry Sector: It is difficult to separate pesticides and seeds because the same corporations are dominant in both sectors – and because seed and agrochemical products are frequently developed and marketed as companion products. In September 2005 ETC Group released a report on global seed industry consolidation, including a list of the world's biggest seed companies and their subsidiaries. The full report is available on ETC Group's website: http://www.etcgroup.org/documents/Comm90GlobalSeed.pdf The top 10 seed companies are listed below.

Top 10 Pesticide Firms

Company	Agrochemical Sales 2004 (US$millions)	% Pesticide Market Share
1. **Bayer** (Germany)	6,120	17%
2. **Syngenta** (Switzerland)	6,030	17%
3. **BASF** (Germany)	4,141	12%
4. **Dow** (USA)	3,368	10%
5. **Monsanto** (USA)	3,180	9%
6. **Dupont** (USA)	2,211	6%
7. **Koor**[23] (Israel)	1,358	4%
8. **Sumitomo** (Japan)	1,308	4%
9. **Nufarm** (Australia)	1,060	3%
10. **Arysta** (Japan)	790	2%

Source: Based on data provided by *Agrow World Crop Protection News,* August 2005.

Top 10 Seed Companies + 1

Company	2004 seed sales
1. **Monsanto** (US) + **Seminis** (acquired by Monsanto 3/05)	$2,277[24] + $526 *pro forma* = $2,803
2. **Dupont/**Pioneer (US)	$2,600
3. **Syngenta** (Switzerland)	$1,239
4. **Groupe Limagrain** (France)	$1,044[25]
5. **KWS AG** (Germany)	$622[26]
6. **Land O' Lakes** (US)	$538[27]
7. **Sakata** (Japan)	$416[28]
8. **Bayer Crop Science** (Germany)	$387[29]
9. **Taikii** (Japan)	$366[30]
10. **DLF-Trifolium** (Denmark)	$320[31]
11. **Delta & Pine Land** (US)	$315

Source: ETC Group

Agrochemical Industry

According to Phillips McDougall, global agrochemical sales (herbicides, fungicides and insecticides) reached $35,400 million in 2004. The top 10 companies accounted for 84% ($29,566 million) of the total market. The top six companies control 71% of the pesticide market; the top 2 control over one-third.

Given the current rate of consolidation, it's no surprise that industry analysts predict only three major companies will survive in the conventional pesticide business by 2015: Bayer, Syngenta and BASF.[32]

According to industry analysts, 2004 was a "bumper year" for the pesticide industry, with all but two of the top 10 companies posting double-digit increases in sales.[33] (Monsanto's agchem revenues grew only 5%, largely because the company is focusing on biotech traits in seeds as its frontline strategy to develop pesticide products; Dupont's revenues increased 9%.)

Spore Wars: Asian soybean rust (*Phakopsora pachyrhizi*) is the primary reason for the jump in fungicide sales. For instance, soybean rust boosted BASF's fungicide sales by 21%; soybean rust in Latin America contributed to an 18% increase in Syngenta's fungicide sales in 2004. Although soybean rust has been a problem in Asia and Australia for decades, the airborne fungus is spreading throughout the Americas; all commercial varieties are susceptible to the disease. In Brazil, the rust spread to three-quarters of the country's soy-growing area over 3 years. In 2005, soybean rust was reported in the southeastern US – where its spread is monitored on a daily basis.[34] In the meantime, scientists are scouring gene banks, and searching for wild relatives of soybean in China and other Asian countries (where farmers first domesticated the crop), hoping to find soybean strains that will provide genetic resistance to the fungus.

Global Food Retail Industry

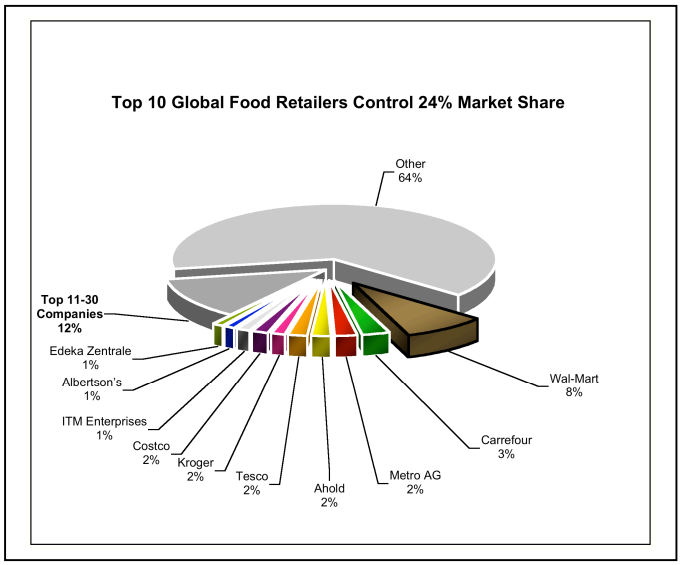
Top 10 Global Food Retailers

Company	2004 Revenues US$ millions	% global market share (grocery retail)
1. Wal-Mart† (US)	$287,989	8%
2. Carrefour (France)	$99,119	3%
3. Metro AG (Germany)	$76,942	2%
4. Ahold (Netherlands)	$70,439	2%
5. Tesco (UK)	$65,175	2%
6. Kroger (US)	$56,434	2%
7. Costco (US)	$52,935	2%
8. ITM Enterprises (France)	$51,800	1%
9. Albertson's (*for sale*) (US)	$39,897	1%
10. Edeka Zentrale (Germany)	$39,100	1%

Source: ETC Group

† Wal-Mart does not report grocery sales separate from total revenues. Market research firm, Retail Forward, estimates that Wal-Mart sold $109 billion in groceries in 2004.

Global Food Retailers, contd.



Source: ETC Group

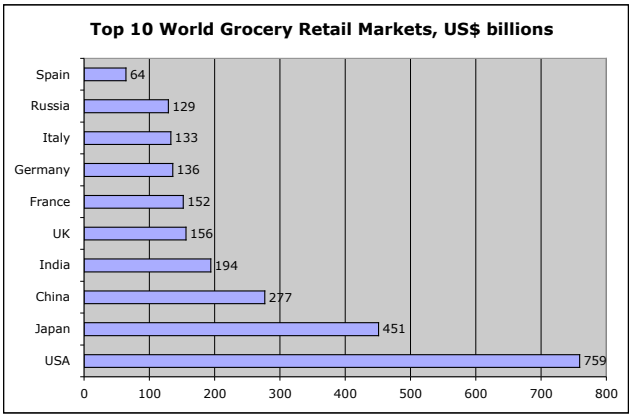
Consolidation, cutthroat competition and aggressive global expansion are the driving forces in the food retail sector – trends that are accelerating at breakneck pace.

Grocery Retail Consolidation:

- Last year, the top 10 global food retailers accounted for combined sales of $840 billion – 24% of the estimated $3.5 trillion global market. (By contrast, ETC Group reported in 2001 that the top 10 grocery giants had combined sales of $513.7 billion, or 18% of the global market share.)

- The top 30 food retailers control an estimated 36% slice of the global retail food market (with combined revenues of $1,262 billion in 2003/04[35]).

- The top 10 global food retailers account for two-thirds of the revenues earned by the top 30 retailers.



Source: ETC Group, based on IGD data, 2005

Mega-Mart Competition: The aptly named "hypermarket" format (a supermarket inside a huge retail box store) is the dominant grocery retail model. Wal-Mart is the biggest and most successful hypermarket, and smaller supermarkets are finding it difficult to compete. Consolidation and corporate cooperation are among the survival strategies. Two recent examples:

- Albertson's, the second largest grocery chain in the US, put itself up for sale in September 2005 because of stagnant sales – unable to compete with the big box retailers.

- In September 2005 two of the world's largest grocery retailers, #2 Carrefour and #5 Tesco, announced an asset-swapping deal. (Carrefour acquired Tesco's assets in Taiwan; and Tesco acquired Carrefour's assets in the Czech Republic and Slovakia.) Industry analysts predict that a marriage between Carrefour and Tesco, while unlikely in the short- to medium-term, would be one of the few combinations that could effectively compete with Wal-Mart on a global level. (IGD)

Global Reach: IGD, a UK-based market research firm, estimates that the grocery retail market share in the world's top 10 national markets is currently $2.45 trillion.[36] IGD analysts estimate that the global retail food and beverage market is $3.5 trillion. Explosive growth is predicted in Asia and Latin America – where the share of retail food sold in supermarkets more than doubled between 1988-1997.

- Analysts predict that the Asian region will reach a 41% share of the global food retail market in 2020 – up from 33% in 2003.[37]

- China will become the world's second largest food retail market behind the USA. The Chinese grocery market will grow by 65% to $456 billion in the next five years. China opened its borders to non-domestic retailers in the early 1990s, and in December 2004 the central government relaxed restrictions on the expansion of international retailers.[38]

- India is poised to open up to foreign investment and IGD predicts that it will become the 4th largest grocery retail market by 2020.[39] Wal-Mart has already announced that it is looking for a swift entry in India.

- According to FAO, supermarkets in Latin America "increased their share of retail food sales by almost as much in one decade as it took them 50 years to do in the United States."[40]

Global Mega-Grocers

Carrefour operates over 11,000 stores (430,000 employees) in more than 30 countries in Europe, Latin America and Asia. France accounts for about half of the company's sales. At the beginning of 2005, Carrefour planned to open 70 hypermarkets, including 15 in China, 7 in Brazil, 6 in Colombia, 5 in Indonesia, 4 in Thailand and 3 in Poland. (IGD)

Wal-Mart: North America accounts for 89% of Wal-Mart's sales (80% is generated in the US alone). Outside the US, Canada and Mexico, Wal-Mart operates in Puerto Rico, Brazil, Argentina, UK, Germany, China and South Korea. Wal-Mart became the number 3 retailer in Brazil when it acquired a leading grocery store chain, Bompreco.

Tesco operates in thirteen markets outside the UK, and is market leader in six of these, mostly in Eastern Europe and Asia.

Metro, Germany's largest retailer, owns and operates about 2,400 stores in Germany and 28 other countries, including India, Russia and Ukraine.

The Costs of Consolidation: Because they sit high on the industrial food chain, multinational grocery retailers wield extraordinary economic and trade power. These companies ultimately decide how, where and by whom a staggering share of the world's food is produced, processed and procured. For example, 80 percent of the 6,000 factories that supply Wal-Mart with products are based in China. In 2004, Peter Goodman and Philip Pan observed in the *Washington Post*:

"As capital scours the globe for cheaper and more malleable workers, and as poor countries seek multinational companies to provide jobs, lift production and open export markets, Wal-Mart and China have forged themselves into the ultimate joint venture, their symbiosis influencing the terms of labor and consumption all over the world." – *Washington Post*, February 8, 2004.[41]

In its 2004 report on food insecurity, the Food and Agriculture Organization of the United Nations (FAO) took special note of multinational supermarket chains and the implications for the food security of millions of farmers and workers in rural areas.[42] According to FAO, supermarkets can mean greater consumer choice, lower prices for urban shoppers and convenience, but the dominance of global supermarkets "has also led to consolidated supply chains in which buyers for a handful of giant food processors and retailers wield increasing power to set standards, prices and delivery schedules."[43] The report notes that, "Smallholders who fail to gain a foothold in this globalized marketplace risk finding themselves consigned to a permanently marginalized minority, excluded from the food system both as producers and as consumers."[44]

"…the globalization of food industries and the expansion of supermarkets present both an opportunity to reach lucrative new markets – and a substantial risk of increased marginalization and even deeper poverty." – FAO, State of Food Insecurity, 2004

A Few Words About Wal-Mart: Wal-Mart is the world's largest corporation and the world's largest purveyor of food. A titanic power in global retailing, Wal-Mart's corporate conduct affects business practices (labour, trade, environment and technology) all over the planet. The company has 1.7 million employees; an estimated 138 million people shop at Wal-Mart every week.

The company's signature strategy is to sell food and merchandise at rock-bottom prices by capitalizing on its massive buying power, squeezing global suppliers to provide the lowest-cost goods and employing state-of-the-art technology to manage inventory. The company is a nonunion, low-wage employer. In 2004, the average Wal-Mart clerk in the US earned about $14,000 a year – below the US poverty level for a family of three, and fewer than half of Wal-Mart employees could afford to purchase the company's least-expensive health care plan.[45]

A February 2004 report prepared by a US Congressional committee concludes that US taxpayers are subsidizing Wal-Mart's low-wages and lack of health benefits – amounting to a total corporate welfare bill of $2 billion per annum.[46] The report estimates that a single Wal-Mart store with 200 employees may cost federal taxpayers $420,000 a year (for government assistance programs covering children's health care, housing, tax-credits, etc.).[47] According to the report, "Whether the issue is basic organizing rights of workers, or wages, or health benefits, or working conditions, or trade policy – Wal-Mart has come to represent the lowest common denominator in the treatment of working people."[48]

Wal-Mart faces scores of legal challenges involving labour violations, including the largest workplace-discrimination lawsuit in US history. A class-action lawsuit involving more than 1.5 million women claims that Wal-Mart discriminated against them in the way it recruited and promoted workers.[49]

In March 2005 Wal-Mart avoided criminal charges by agreeing to pay a record $11 million to settle accusations that it used hundreds of illegal immigrants to clean its US stores.[50]

Up to 500,000 workers from Bangladesh, China, Swaziland, Indonesia and Nicaragua filed a class-action suit against Wal-Mart in September 2005 alleging that the company overlooks sweatshop conditions in its suppliers' factories.[51]

In response to negative publicity, Wal-Mart has launched a powerful counter-offensive. In October the company's CEO pledged higher environmental standards such as reducing greenhouse-gas emissions at stores by 20% in the next 7 years; making low-cost health care plans available to workers; and calling on Congress to raise the minimum wage. One critic called it "a publicity stunt full of empty rhetoric that promises nothing to workers."[52]

Food & Beverage Processing Industry

Top 10 Food & Beverage Corporations, 2004

Company	2004 Food & Beverage Revenues US$ millions	2004 Total Revenue US$millions
1. Nestlé	$63,575	$69,862
2. Archer Daniels Midland	$35,944	$35,944
3. Altria Group	$32,168	$69,963
4. PepsiCo	$29,261	$29,261
5. Unilever	$29,205	$52,267
6. Tyson Foods	$26,441	$26,441
7. Cargill	$24,000	$62,907
8. Coca-Cola	$21,962	$21,962
9. Mars, Inc.	$18,000	$18,000
10. Groupe Danone	$17,040	$17,040

Source: Global Food Markets (GFM), Leatherhead Food International

- According to market research firm, Leatherhead Food International, food & beverage sales from the top 10 companies amounted to $297 billion, or 24% of the estimated $1,250 billion global market for packaged foods.
- The top 100 food companies had combined 2004 food and beverage sales of $829 billion,[53] the top 100 food companies account for two-thirds of the global market share.
- The top 10 account for 36% of the revenues earned by the top 100 food & beverage firms.

Walmartization of the Food & Beverage Industry: Industry analysts note that Wal-Mart's domination of the retail market is driving consolidation – not only in retailing – but also up and down the food chain. The quest to win shelf space in the world's largest grocery business is fueling intense competition among food & beverage suppliers. As one industry analyst put it, "shelf space is diamond-encrusted gold."[54] Mergers and acquisitions are one of the survival strategies that food and beverage companies are using to achieve the economy of scale needed to respond to Wal-Mart's low-price mandate. This trend is driving deals like Procter & Gamble's $57 billion acquisition of Gillette in January 2005 – a merger that created a global manufacturing company with annual turnover in excess of $60 billion.

The big squeeze: With Wal-Mart expanding its own private label for food products, food manufacturers are now finding themselves sandwiched between the world's most powerful buyer and seller – Wal-Mart is both their biggest customer and one of their biggest competitors. Wal-Mart's private label brands now represent an estimated 40% of Wal-Mart's sales.[55]

Technology: Wal-Mart is dictating trends in technology that are dramatically changing inventory management practices worldwide. By January 2006 Wal-Mart will require its top 300 suppliers to use Radio Frequency Identification (RFID) tags on all cases and pallets. Other super-size retailers are following suit. RFID tags are microchips that transmit product identification to a remote electronic reader. Wal-Mart's goal is to cut costs by keeping shelves filled only with essential inventory and to combat theft. A typical supplier will spend an estimated $9 million dollars complying with Wal-Mart's RFID policy during the first two years of implementation.[56] As a result of Wal-Mart's mandate, RFID tags have moved from an emerging technology to a mainstream technology. Consumer rights advocates warn that ubiquitous data-carrying chips will eventually be affixed to all products on the shelves and data collection won't stop after a shopper leaves the store. Corporate-mandated RFID tags mark the beginning of a new generation of commercial surveillance technologies that threaten to violate privacy and civil liberties.

China Syndrome: With 1.3 billion consumers and rising per capita income, China is the land of expansion for global capital – including food and beverage processors. Procter & Gamble, Unilever, Kraft and Budweiser are among the companies making a swift and early entry to cultivate brand loyalty. Procter & Gamble is reportedly the largest advertiser in China.

Nanotechnology

Because biological processes operate on the scale of the nanometre – one billionth of a metre – many of the world's largest industrial corporations see nanotechnology – the emerging science of manipulating matter on the nano-scale – as a new technology platform for discovering, manufacturing and delivering new drugs and agricultural inputs, bringing new flavours and nutrients to foods, diagnosing diseases earlier and treating them more effectively.

Worldwide, the private and public sectors combined spent about $10 billion on nanotech R&D in 2004, and Lux Research, a market research firm, predicts that 2005 will mark the first year industry spends more on R&D than governments.[57] 2005 also marks a consensus of sorts, with industry, government and academia taking up the same battle cry (finally catching up to civil society): "More funding to address the health and safety implications of nano-scale materials!"[58] All within one week in late 2005, the UK government released a first report, "Characterising the potential risks posed by engineered nanoparticles;"[59] the Woodrow Wilson International Center for Scholars in Washington launched an on-line inventory of government-funded risk-related nanotech research, endorsed by the NanoBusiness Alliance;[60] and the US Environmental Protection Agency produced a draft White Paper, focusing on risk management of possible negative impacts of nanomaterials on the environment.[61]

The toxicology of nano-materials is still unknown territory, regulations are non-existent and discussion of nanotech's societal impacts is barely a whisper, but nanotechnology products are coming to market at a steady pace.

In late 2004 the US Patent and Trademark Office (US PTO) established a special classification (Class 977) for nanotechnology patents. Patent examiners are still reviewing already-issued patents to

determine which meet the Class 977 criteria and should be included, and newly-issued patents are added weekly.[62] Class 977 does not yet provide a comprehensive picture of nanotech patenting but with over 2600 patents, it gives a snapshot worth a closer look:

Top 10 Nanotech Patent Assignees, US PTO Class 977
(2607 patents searched, Dec. 7, 2005)

Assignee/Headquarters	No. of Class 977 Patents
1. IBM, USA	80
2. The United States of America*	69
3. Silverbrook Research, Australia	60
4. Canon Kabushiki Kaisha, Japan	56
5. University of California, USA	45
6. Hitachi, Ltd., Japan	30
7. Advanced Micro Devices, USA	28
8. L'Oréal, France	26
8. Eastman Kodak, USA	26
9. California Institute of Technology, USA	22
9. Micron Technology, Inc., USA	22
10. Procter & Gamble Co., USA	21
10. Seagate Technology, USA	21

***Class 977 Patents Assigned to US government**

Navy	18
Department of Health and Human Services	13
Army	10
NASA	8
Department of Commerce	8
Department of Energy	4
Air Force	5
National Security Agency	1
Department of Agriculture	1
The United States of America	1

Nanobiotechnology/Synthetic Biology: A New Leash on Life?

"Making life better, one part at a time." That's the tagline – and the mission – of the Synthetic Biology Working Group at the Massachusetts Institute of Technology (MIT). Working at the interface between life sciences and engineering, researchers in this new discipline seek to create biological molecules and cells, or entire organisms, to perform useful tasks, such as producing pharmaceutical compounds or energy.[63] In the words of one MIT scientist, "Biology will never be the same."[64]

Synthetic biology's ambitious project – the "intentional design, modeling, construction, debugging, and testing of artificial living systems,"[65] with a focus on applications – requires bringing together biological components that exist in nature or are human-made. In the cases where components include human-made nano-scale materials, the fields of nanobiotechnology and synthetic biology are synonymous.

> "…it begins to appear reasonable that synthetic biologists will some day create living gizmos that we will use in our cars and houses, bacteria that parasatize cancer cells, or computers that use glucose as an energy source." – from Pamela Silver and Jeffrey Way, "Cells by Design," *The Scientist*, September 27, 2004.

Trying to "make life better" than nature is biology's new frontier. Predictably, the science is moving faster than serious consideration of its implications and without societal debate. In June 2005, three institutions – the J. Craig Venter Institute, the Center for Strategic & International Studies and MIT – announced they will jointly examine the societal implications of synthetic biology in a 15-month study, funded by a $570,000 grant from the Alfred P. Sloan Foundation. Unfortunately, those stepping up to assess the implications of synthetic biology are closely linked to those seeking to profit from it. One of the project's directors, Drew Endy of MIT, is co-founder of Codon Devices, a company that synthesizes customized DNA segments. Another project director, Robert Friedman, is employed by the Venter Institute, whose founder, Craig Venter, raised $30 million from private investors to establish Synthetic Genomics, Inc., a company set up to manufacture organisms for industrial purposes (see table).

Consider recent milestones in the evolution of synthetic biology:

- In March 2005, the Nature Publishing Group founded a new peer-reviewed on-line journal, *Molecular Systems Biology,* devoted to the field of synthetic biology. While the journal is freely accessible, authors must pay a $3000 "article-processing" charge if their submission is accepted.
- In September 2005, researchers reported on the total synthesis of a virus, Bacteriophage T7.

Bacteriophage T7 exists in nature and has been studied for more than fifty years, but this newly-made T7 is a different creature, referred to by its makers as T7.1. The human-made virus is a streamlined upgrade of T7, with 30% of its genome redesigned.[66]

- In late 2005, The BioBricks Foundation (BBF) was established to develop an "open commons of basic biological functions." The BBF is linked to the "MIT Registry of Standard Biological Parts," begun in 2004, which contributes to the commons by recording and indexing biological parts currently being built. It also offers "synthesis and assembly services to construct new parts, devices, and systems."
- In 2005, teams from 13 schools in North America and Europe participated in the "intercollegiate Genetically Engineered Machine" (iGEM) competition held at MIT.[67] Using biological parts from MIT's Registry, students created living systems intended to perform tasks – this year's submissions included bacteria acting as environmental sensors, gene circuits capable of counting and a bacterial relay race. According to the director of the Registry, Randy Rettberg, the competition demonstrates that students are beginning to fully appreciate that biology can be marshaled to perform almost anything that mechanical or electronic systems can.[68] Plans for next year's competition are underway.

The New Kids on the Block: Synthetic Biology Companies

Company	What They Do
Amyris Biotechnologies, USA www.amyrisbiotech.com	Founded in 2004, Amyris is the "poster child" for synthetic biology. With a $12.5 million grant from the Gates Foundation, the company seeks to engineer a microbe to produce an inexpensive supply of the anti-malarial drug artemisinin – a chemical now found only in small traces in the wormwood plant. Amyris may also use its proprietary technology to produce compounds such as fine chemicals, vitamins and flavorings.
Biotica, UK www.biotica.co.uk	Biotica uses synthetic biology (e.g., bioactive polyketides) in the service of drug discovery. Polyketides are a diverse class of natural products that Biotica claims are "a prolific source of commercially significant pharmaceuticals, currently representing worldwide sales in excess of $20 billion per annum."
Blue Heron Biotechnologies, USA www.blueheronbio.com	Blue Heron synthesizes genes "regardless of sequence, complexity, or size with 100% accuracy" using its proprietary GeneMaker technology. The company offers "a special price for new customers: $1.60 per base pair." (Even at this bargain price, the smallest complete bacteria genome [*Mycoplasma genitalium*, with 580,000 base pairs] would cost almost $1 million to synthesize.)
Codon Devices, USA www.codondevices.com	Founded in 2004, Codon is developing a proprietary "BioFAB production platform" expected to accurately synthesize kilobase- to megabase-length genetic code, orders of magnitude faster and cheaper than currently available technology. The company sells "sets of biological parts for large-scale research projects, engineered cells that produce novel pharmaceuticals, engineered protein biotherapeutics, and novel biosensor devices." Codon has raised $13 million in venture capital and expects to begin generating revenue by the end of 2005.[69]
Synthetic Genomics, USA www.syntheticgenomics.com	Founded by genomics mogul J. Craig Venter in 2005, the company intends to produce organisms with "reduced or reoriented metabolic needs" that can "enable new, powerful, and more direct methods of bio-engineered industrial production." Tagline: "Imagine a future…when researchers can use a modular, software-like product to design new microbial genomes which are manufactured on an industrial scale."
GeneArt, Germany www.geneart.com	Spun off from Regensburg University in 1999, GeneArt is a gene synthesis company using its proprietary GeneOptimizer technology. GeneArt was named one of Germany's top ten fastest-growing technology companies.
DNA 2.0, USA www.dnatwopointo.com	Founded in 2003, DNA 2.0 uses its "DNA-2-Go" process to synthesize genes, specializing in protein optimization technologies. In late 2004, DNA 2.0 received a $1.1 million grant from the Defense Advanced Research Projects Agency (DARPA) to develop biological plastics that covert to fuel.

The Global Economy: Who's Got the Power?

Corporate Revenue vs. National Income

**GNI is Gross National Income*

	Company or Country	GNI* 2004 (countries) or 2004 Revenue (companies) US$millions
1	United States	12,150,931
2	Japan	4,749,910
3	Germany	2,488,974
4	United Kingdom	2,016,393
5	France	1,858,731
6	China	1,676,846
7	Italy	1,503,562
8	Canada	905,629
9	Spain	875,817
10	Mexico	703,080
11	India	674,580
12	Korea, Rep.	673,036
13	Brazil	552,096
14	Australia	541,173
15	Netherlands	515,148
16	Russian Federation	487,335
17	Switzerland	356,052
18	Belgium	322,837
19	Sweden	321,401
20	WAL-MART	287,989
21	BP	285,059
22	EXXONMOBIL	270,772
23	Turkey	268,741
24	ROYAL DUTCH/SHELL	268,690
25	Austria	262,147
26	Indonesia	248,007
27	Saudi Arabia	242,180
28	Norway	238,398
29	Poland	232,398
30	Denmark	219,422
31	GENERAL MOTORS	193,517
32	Greece	183,917
33	Hong Kong, China	183,516
34	DAIMLER CHRYSLER	176,688
35	TOYOTA MOTOR	172,616
36	FORD MOTOR CO.	172,233

	Company or Country	GNI 2004 (countries) or Revenue (companies) US$millions
37	Finland	171,024
38	South Africa	165,326
39	Thailand	158,703
40	Iran, Islamic Rep.	153,984
41	GENERAL ELECTRIC	152,866
42	TOTAL SA	152,610
43	Portugal	149,790
44	CHEVRON	147,967
45	Argentina	142,338
46	Ireland	137,761
47	CONOCOPHILLIPS	121,663
48	AXA	121,606
49	ALLIANZ AG	118,937
50	Israel	118,124
51	Malaysia	117,132
52	VOLKSWAGEN	110,649
53	CITIGROUP	108,276
54	ING GROUP	105,886
55	Singapore	104,994
56	Venezuela, RB	104,958
57	NIPPON TELEPHONE	100,545
58	AMERICAN INTN'L GROUP	97,987
59	Philippines	96,930
60	IBM	96,293
61	Czech Republic	93,155
62	SIEMENS AG	91,493
63	Pakistan	90,663
64	Colombia	90,626
65	CARREFOUR SA	90,382
66	Egypt, Arab Rep.	90,129
67	HITACHI, LTD.	83,994
68	Hungary	83,315
69	ASSICURAZIONI GENERALI	83,268
70	New Zealand	82,465
71	MATSUSHITA ELECTRIC	81,078

	Company or Country	GNI 2004 (countries) or Revenue (companies) US$millions
72	MCKESSON	80,515
73	HONDA MOTOR	80,487
74	HEWLETT-PACKARD	79,905
75	NISSAN MOTOR	79,800
76	Chile	78,407
77	FORTIS	75,518
78	SINOPEC	75,077
79	BERKSHIRE HATHAWAY	74,382
80	ENI	74,228
81	Algeria	73,676
82	HOME DEPOT	73,094
83	AVIVA	73,025
84	HSBC HOLDINGS	72,550
85	DEUTSCHE TELEKOM	71,989
86	VERIZON COMMUNICATIONS	71,563
87	SANSUNG ELECTRONICS	71,556
88	STATE GRID CORP OF CHINA	71,290
89	PEUGEOT	70,642
90	METRO	70,159
91	NESTLE	69,826
92	US POSTAL SERVICE	68,996
93	BNP PARIBAS	68,654
94	CHINA NAT'L PETROLEUM	67,724
95	SONY	66,618
96	CARDINAL HEALTH	65,131
97	Peru	65,043
98	ROYAL AHOLD	64,676
99	ALTRIA GROUP	64,440
100	Romania	63,910

Source: ETC Group, based on World Bank (World Development Indicators database, World Bank, 15 July 2005) and on *Fortune* Global 500 database 2004.

Conclusion: Already super-sized corporations with ballooning market shares are growing even larger. It is citizen action and debate at all levels – local, national and international – that offers meaningful challenges to corporate hegemony. Because corporations operate with global reach, beyond the boundaries of any single country, reform will also require debate, oversight and monitoring at the intergovernmental level. The United Nations in tandem with civil society, peasant farmers, trade unionists and social movements must re-gain the capacity to monitor, regulate and reform the activities of transnational enterprises.

Thirteen years ago, due to pressure from the United States, the UN Centre on Transnational Corporations in New York was shut down and the intergovernmental community lost its capacity to monitor global corporate activity. The US is undoubtedly less enthusiastic about corporate monitoring today than it was in 1993. Nevertheless, South governments and civil society need corporate watchdogs. It is unconscionably bad governance for OECD states not to provide the financial resources necessary to create such a body. It is equally bad governance for the UN not to have a global technology monitoring and evaluation capacity. On December 12th in Hong Kong, ETC Group provided the South Centre with a study looking at the potential impact of new nano-scale technologies on Commodity Dependent Developing Countries. The report is available at www.southcentre.org. The report reiterates ETC Group's call for the creation of an International Convention on the Evaluation of New Technologies (ICENT) also described in our recent *Communiqué*, "Nanogeopolitics," available here: http://www.etcgroup.org/article.asp?newsid=520

A Note about Sources:

ETC Group notes that access to corporate intelligence is increasingly harder to come by. While annual reports and 10K forms are still freely available, many libraries can no longer afford to buy the most up-to-date market research reports. With increasing levels of corporate consolidation, a small circle of competing firms carefully "manage" information and decide what's best for public consumption. We've noticed that some industry trade journals that survive on corporate advertisers (and subscribers) have stopped publishing industry rankings or critical analysis of industry trends. The editor of one trade journal told ETC Group that all information in her company's magazine was copyrighted "and you will need my permission to use anything from the magazine." One UK analyst refused to provide information due to "a potential conflict of interest between your organization and our client base." Market research information abounds, but most of it is proprietary and expensive – and industry analysts don't always collaborate with civil society. Fortunately, there are some exceptions. ETC Group is extremely grateful to individuals at the following firms who have been willing to share market research information: *Agrow World Crop Protection News*, *Animal Pharm Reports*, *Scrip's Pharmaceutical League Tables* (PJB Publications), IGD, Leatherhead Food International and Retail Forward.

Endnotes

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