

Flowers, Diamonds, and Gold: The Destructive Public Health, Human Rights, and Environmental Consequences of Symbols of Love

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ABSTRACT

On Valentine's Day, anniversaries, and throughout the year, suitors and lovers buy cut flowers and diamond and gold jewelry for the objects of their affection. Their purchases are in part a consequence of timely traditions maintained by aggressive marketing. Most buyers are unaware that in gifting their lovers with these aesthetically-beautiful symbols, they are supporting industries which damage the environment, utilize forced labor, cause serious health problems, and contribute to violent conflicts. This article reviews the health and environmental consequences of, and the human rights abuses associated with, the production of cut flowers, gold, and diamonds. Recommendations to improve the safety of production standards are offered, as well as alternative gift suggestions which do not promote environmental degradation, human suffering, and death.

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I. INTRODUCTION: CUPID'S POISONOUS AND DEADLY ARROW

On Valentine's Day, anniversaries, and throughout the year, suitors and lovers buy cut flowers and diamond and gold jewelry for the objects of their affection. Their purchases are in part a consequence of timely traditions maintained by aggressive marketing. Most buyers are unaware that in gifting their lovers with these aesthetically beautiful symbols, they are supporting industries which damage the environment, utilize forced labor, cause serious acute and chronic health problems, and contribute to violent conflicts. This article reviews the health and environmental consequences of, and the human rights abuses associated with, the production of cut flowers, gold, and diamonds. Recommendations to improve the safety of production standards are offered, as well as alternative gift suggestions for those wishing to show their affection in ways which do not promote environmental degradation, human suffering, and death.

II. FLOWERS

A. Buds and Thorns

Flowers have a long history of religious, folk, heraldic, and national symbolism. Today, they are given as symbols of love, friendship, and filial devotion, particularly on St. Valentine's and Mother's Days. However, the beauty of cut flowers masks a system of growth and production marked by environmental degradation, labor abuses, and the exposure of almost 200,000 people in the developing world to a variety of toxic chemicals.¹ Compensation is poor, relative to the risks involved. For instance, on an average day, one woman working in a Colombian carnation field will pick over 400 top-grade flowers. Four such flowers will cost just under \$4.00 at a US florist, more than the worker earns in a day.²

B. The Floriculture Industry

The \$30 billion cut-flower industry traditionally has been based in Holland and Colombia, but now encompasses Kenya, Zimbabwe, Ecuador, India,

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1. David Tenenbaum, *Would a Rose Not Smell as Sweet? Problems Stem from the Cut Flower Industry*, 110 ENVIRON. HEALTH PERSPECT. A240, A241 (2002).
 2. Kevin Watkins, *Deadly Blooms*, THE GUARDIAN, 29 Aug. 2001, available at <http://society.guardian.co.uk/societyguardian/story/0,7843,543351,00.html>. These issues were dramatized briefly in the poignant and powerful 2004 film, *Maria Full of Grace*.

Mexico, China, and Malaysia. Dole Fresh Flowers (a division of Dole Foods Company, Inc.) is the world's largest producer.³ The United States, Japan, and Germany are the major consuming nations.⁴ Germany and the United States are the largest import markets; most flowers headed for Germany come from the Netherlands, while those destined for the United States originate in Europe and Central and South America. Ecuador and Colombia together account for the origin of almost half of all flowers sold in the United States.⁵ Floriculture now employs about 190,000 people in the developing world.⁶ Roses are the main product traded internationally. Most profits flow to multinational corporations, headquartered outside the producing country.⁷ Given the profitability of floriculture and its serious adverse effects on human health and the environment in the developing world, it seems safe to argue that these companies inadequately re-invest profits in local economies.

C. Worker Health

The floriculture industry's predominantly female workforce is paid low wages with no benefits and short contract cycles.⁸ Child labor, dismissal from employment due to pregnancy, and long hours of unpaid overtime are common, especially before holidays such as St. Valentine's Day and Mother's Day.⁹

The industry claims that its jobs are more stable than those in traditional farming, which may produce export crops subject to unstable price cycles. However, the use of land for floriculture rather than for growing crops for local food consumption contributes to malnutrition and increased food costs for locals.¹⁰ Flower production requires large quantities of irrigation water, contributing to a drop in water tables in many flower-producing regions around the world.¹¹

Flowers are the most pesticide-intensive crop.¹² They are grown and picked in warm, enclosed greenhouses, which keep pests out but result in

3. Tenenbaum, *supra* note 1, at A246.

4. International Labor Organization (ILO), *Working Paper on the World Cut Flower Industry: Trends and Prospects*, SAP 2.80/WP.139 (28 Sep. 2000), available at <http://www.ilo.org/public/english/dialogue/sector/papers/ctflower/index.htm>.

5. Ross Wehner, *Flower Power: With an Entrepreneur's Jump Start, the Organic Market Blossoms*, E/THE ENVIRONMENTAL MAGAZINE, Nov.–Dec. 2004.

6. Tenenbaum, *supra* note 1, at A241.

7. Watkins, *supra* note 2.

8. Elizabeth A. Stanton, *Flowers for Mother's Day?*, DOLLARS AND SENSE: THE MAGAZINE OF ECONOMIC JUSTICE, May/June 2003, available at http://www.dollarsandsense.org/0503_stanton.html.

9. *Id.*

10. Tenenbaum, *supra* note 1, at A245.

11. Watkins, *supra* note 2.

12. Wehner, *supra* note 5.

high ambient levels of pesticides. One-fifth of the fertilizers, insecticides, fungicides, nematocides, and plant growth regulators used in floriculture in developing countries are banned or untested in the United States.¹³ Many are known carcinogens. Flowers carry up to fifty times the amount of pesticides allowed on foods, yet flowers entering the United States, while checked carefully by the Department of Agriculture for pests, are not inspected for pesticides, because they are not considered food.¹⁴

Over 50 percent of workers report at least one symptom of pesticide exposure.¹⁵ Acute organophosphate pesticide exposure causes increased salivation, tearing, blurred vision, nausea, vomiting, abdominal cramps, urinary and fecal incontinence, increased bronchial secretions, coughing, wheezing, and sweating. In rare cases "involving more severe acute intoxication, dyspnea, bradycardia, heart block, hypotension, pulmonary edema, paralysis, convulsions, or death may occur."¹⁶

Floriculture workers also experience: allergic reactions; dermatitis; heat-related illnesses; asthma, hypersensitivity pneumonitis, and emphysema; repetitive stress injury and accelerated osteoarthritis; hepatotoxicity; acute and chronic bronchitis; urinary tract infections (resulting from urinary retention, a consequence of limited bathroom breaks); bacterial and fungal cellulitis resulting from skin pricks acquired from de-thorning roses; increased risk of cancers of multiple organs; permanent neurological deficits, such as peripheral neuropathy and deficits in motor skills, memory (or attention); mental health problems; chromosomal defects; and other cancers.¹⁷

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13. Tenenbaum, *supra* note 1, at A242; Stanton, *supra* note 8.
 14. Tenenbaum, *supra* note 1, at A242–A243; Wehner, *supra* note 5; Stanton, *supra* note 8.
 15. Tenenbaum, *supra* note 1, at A243.
 16. Eric Hansen & Martin T. Donohoe, *Health Issues of Migrant and Seasonal Farmworkers*, 14 J. HEALTH CARE FOR THE POOR AND UNDERSERVED 153, 157 (2003); Martin T. Donohoe, *Trouble in the Fields: Effects of Migrant and Seasonal Farm Labor on Women's Health and Well-Being*, 9 MEDSCAPE OB/GYN AND WOMEN'S HEALTH (2004), available at <http://www.medscape.com/viewarticle/470445>.
 17. Linda Rosenstock, Matthew Keifer, William E. Daniell, Robert McConnell & Keith Claypoole, *Chronic Central Nervous System Effects of Acute Organophosphate Pesticide Intoxication*, 338 THE LANCET 223, 223–28 (1991); Shelia Hoar Zahm & Mary H. Ward, *Pesticides and Childhood Cancer*, 106 (Supp. 3) ENVIRON. HEALTH PERSPECT. 893, 893–98, 904–05 (1998); TED SCHETTLER, GINA SOLOMON, MARIA VALENTI & ANNETTE HUDDLE, GENERATIONS AT RISK: REPRODUCTIVE HEALTH AND THE ENVIRONMENT 107, 115–25 (1999); Lola Roldán-Tapia, Tesifón Parrón & Fernando Sánchez-Santed, *Neuropsychological Effects of Long-Term Exposure to Organophosphate Pesticides*, 27 NEUROTOXICOL. & TERATOL. 259, 259–60, 263–64 (2005); Eduard Monsó, Ramón Magarolas, Isabel Badorrey, Katja Radon, Dennis Nowak & Josep Morera, *Occupational Asthma in Greenhouse Flower and Ornamental Plant Growers*, 165 AM. J. RESPIR. & CRIT. CARE MED. 954, 954–58 (2002); B. F. Lander, L. E. Knudsen, M. O. Gamborg, H. Jarnentaus, H. Norppa, *Chromosome Aberrations in Pesticide-Exposed Greenhouse Workers*, 26 SCANDINAVIAN J. WORK, ENV'T & HEALTH 436 (2000); Eduard Monsó, *Occupational Asthma in Greenhouse Workers*, 10 CURR. OPIN. IN PULM. MED. 147, 149 (2004); E. Paulsen, J. Sjøgaard, K. E. Andersen, *Occupational*

Some pesticides outlawed in the United States but still used abroad are persistent organic pollutants, which may have endocrine, reproductive, and oncogenic effects on pregnant women, fetuses, and growing children.¹⁸ Greenhouse work has been associated with decreased sperm counts in men, delayed time in conception, and increased prevalence of spontaneous abortion, prematurity, and congenital malformations (among children conceived after either parent started working in floriculture).¹⁹ In particular, prolonged standing and bending, overexertion, dehydration, poor nutrition, and pesticide exposure contribute to increased risk of spontaneous abortion, premature delivery, fetal malformation and growth retardation, and abnormal postnatal development.²⁰ Lack of prenatal care, while not unique to floriculture employees in the developing world, augments these problems.

Floriculture workers usually do not recognize pesticide exposure as the cause of their symptoms. Defects in safe handling practices are common, including failures in labeling and handling toxic materials; storage, application, and safe disposal of pesticides; educating workers on the dangers of pesticide exposure; provision of protective gear; and proper dosing and application of pesticides. Material data safety sheets are generally unavailable, and protective equipment, when supplied, may be old or non-functional.²¹ "Reuse of pesticide-saturated greenhouse plastic for domestic purposes such as covering houses" is not uncommon.²² Workers carry pesticides home on their clothes, which they may wash in the same sink used for bathing children

Dermatitis in Danish Gardeners and Greenhouse Workers: (I) Prevalence and Possible Risk Factors, 37 CONTACT DERMATITIS 263, 263–64, 268–69 (1997). See generally, Grace J. A. Ohayo-Mitoko, Hans Kromhout, Philip N. Karumba & Jan S. M. Boleij, *Identification of Determinants of Pesticide Exposure Among Kenyan Agricultural Workers Using Empirical Modeling*, 43 ANN. OCCUP. HYG. 519 (1999).

18. Carlos Sonnenschein & Ana M. Soto, *An Updated Review of Environmental Estrogen and Androgen Mimics and Antagonists*, 65 J. STEROID BIOCHEM. & MOLEC. BIOL. 143, 144–47, 149 (1998); SCHETTLER ET. AL., *supra* note 17, at 107–11, 113–20, 122–25. See generally, Rosenstock et. al., *supra* note 17, at 223–28; Zahm & Ward, *supra* note 17, at 893–905.
19. Annette Abell, Erik Ernst, & Jens Peter Bonde, *Semen Quality and Sexual Hormones in Greenhouse Workers*, 26 SCANDINAVIAN J. WORK, ENV'T & HEALTH 492 (2000); Grazia Petrelli & Irene Figa-Talamanca, *Reduction in Fertility in Male Greenhouse Workers Exposed to Pesticides*, 17 EUR. J. EPIDEMIOL. 675 (2001); Markku Sallmen, Jyrki Liesivuori, Helena Taskinen, Marja-Liisa Lindbohm, Ahti Anttila, Lea Aalto, Kari Hemminki, *Time to Pregnancy among the Wives of Finnish Greenhouse Workers*, 29 SCANDINAVIAN J. WORK, ENV'T & HEALTH 85 (2003); Annette Abell, Svend Juul, Jens Peter Bonde, *Time to Pregnancy among Female Greenhouse Workers*, 26 SCANDINAVIAN J. WORK, ENV'T & HEALTH 131 (2000); Sandra Gomez-Arroyo, Yooko Diaz-Sanchez, M. Angel Meneses-Perez, Rafael Villalobos-Pietrini, Jorge De Leon-Rodriguez, *Cytogenetic Biomonitoring in a Mexican Floriculture Worker Group Exposed to Pesticides*, 466 MUTATION RES. 117 (2000); Tenenbaum, *supra* note 1.
20. Tenenbaum, *supra* note 1, at A245; Hansen & Donohoe, *supra* note 16, at 158; Donohoe, *Trouble in the Fields*, *supra* note 16; SCHETTLER, *supra* note 17, at 16–18.
21. Tenenbaum, *supra* note 1, at A244.
22. Tenenbaum, *supra* note 1, at 243.

and food preparation. The doctors treating these affected patients often do not inform them that their illnesses may be due to pesticide exposure, either because of a lack of knowledge or dual loyalties when they are employed by the floriculture company.²³

III. DIAMONDS

A. History and Production

Diamonds (from the Greek *adamas*, meaning unconquerable or indestructible) are transparent gems made from carbon early in the earth's history under extremes of pressure and temperature.²⁴ They have at various times stood for wealth, power, love, and magical powers. Diamonds are used to produce jewelry and in industry, where they are valued for their hardness and durability.

Alluvial diamonds were discovered in India around 800 B.C.; but it was not until the discovery of massive diamond deposits in South Africa in 1866 that commercial mining began in earnest. Today diamonds are mined in at least twenty nations, with the bulk coming from Australia, Zaire, Botswana, Russia, and South Africa. The major diamond trade centers are Antwerp, Tel Aviv, New York, and Mumbai (Bombay); while most cutting is done in Tel Aviv, Mumbai, New York, and Thailand. Major retail markets include the United States and Japan. Forty-eight percent of diamond jewelry is sold in the United States.²⁵

B. Marketing

The idea of the diamond engagement ring was introduced in 1477, when Archduke Maximilian of Austria gave one to Mary of Burgundy, but the practice really did not catch on until 1939. That year, the De Beers company, founded in 1888 by Cecil Rhodes, hired N.W. Ayer and Company to make diamonds "a psychological necessity . . . the larger and finer the diamond, the greater the expression of love."²⁶ Within three years, 80 percent of en-

23. *Id.*

24. ANTHONY M. EVANS, *ORE GEOLOGY AND INDUSTRIAL MINERALS: AN INTRODUCTION* 104, 110–12 (3d ed. 1993).

25. Andrew Cockburn, *Diamonds: The Real Story*, NATIONAL GEOGRAPHIC, Mar. 2002, at 21.

26. Sarah Wilkins, *For Richer or Poorer: Rocking the World*, MOTHER JONES 24 (Jan./Feb. 2005), available at <http://www.motherjones.com/news/exhibit/2005/01/exhibit.html>.

gagements in the United States were consecrated with diamond rings.²⁷ In 1947, the slogan “A Diamond Is Forever” was born. Jewelers were instructed to pressure men—who buy 90 percent of all diamonds—to spend at least two months’ salary on a ring. In 1999, Advertising Age Magazine declared the “Diamond is Forever” slogan the most effective of the twentieth century, recognized by 90 percent of Americans. In 2003, De Beers began a new campaign to market diamonds to single women with the slogan, “Your left hand says ‘we,’ your right hand says ‘me.’”²⁸

C. Profits and Losses

The 120 million carats of rough diamonds mined for jewelry each year weigh a total of twenty-four tons. They cost less than \$2 billion to extract, yet ultimately sell for over \$50 billion.²⁹ The overwhelming majority of profits do not reach the millions of diggers and miners, who earn only a subsistence living from alluvial and mine-based diamonds. Desperately poor and hoping to strike it rich in this “casino economy,” most leave their homes to work under dangerous, unhealthy conditions, yet still earn a pittance.³⁰ Middlemen, diamond dealers, and exporters earn the lion’s share of diamond mining income; a high proportion are foreign nationals, most of whom tend to reinvest very little in the industry or the country.³¹

D. Human Rights Abuses, Conflict, and Terrorism

Diamond mine owners violate indigenous peoples’ rights by joining with local and national governments in activities that have the effect of destroying traditional homelands and forcing resettlement.³² Mining hastens the environmental degradation of places already facing ecosystem pressures

27. *Id.*

28. *Id.*

29. Cockburn, *supra* note 25, at 13.

30. GLOBAL WITNESS & PARTNERSHIP AFRICA CANADA, RICH MAN, POOR MAN: DEVELOPMENT DIAMONDS AND POVERTY DIAMONDS: THE POTENTIAL FOR CHANGE IN THE ARTISANAL ALLUVIAL DIAMOND FIELDS OF AFRICA (22 Oct. 2004) at 1, 6, available at http://www.globalwitness.org/media_library_detail.php/127/en/rich_man_poor_man.

31. *Id.*

32. Tom Price, *Exiles of the Kalahari*, MOTHER JONES 30 (Jan./Feb. 2005), available at http://www.motherjones.com/news/dispatch/2005/01/01_800.html. See Elizabeth Stanton, Center for Popular Economics: Field Guide to the U.S. Economy, Econ-Atrocity: Ten Reasons Why You Should Never Accept a Diamond Ring from Anyone, Under Any Circumstances, Even if They Really Want to Give You One (14 Feb. 2002), available at <http://www.fguide.org/?p=53> [hereinafter Econ-Atrocity].

such as war, overpopulation, deforestation, unsustainable agricultural and fishing practices, and rapidly dwindling supplies of clean water.³³

Over the past decade, diamonds have been used by rebel armies in Angola, Sierra Leone, and the Democratic Republic of the Congo to pay for weapons used to fight some of Sub-Saharan Africa's most brutal civil wars. The Revolutionary United Front (RUF) in Sierra Leone killed and mutilated tens of thousands of people through its "signature tactic" involving amputation of hands, arms, legs, lips, and ears with machetes and axes, a tactic that was used to gain control over diamond mines. With the financial support of the diamond industry's trading centers, and backed by child soldiers forcibly conscripted and drugged to blunt their fear, reluctance to fight, and innate revulsion to killing, the RUF made millions off of diamonds that were extracted by thousands of prisoner-laborers.³⁴ Miners, worked to exhaustion, exposed to human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) from camp sex-slaves, frequently were executed for suspected theft, lack of production, or simply for sport.³⁵

Osama bin Laden's terrorist network, al Qaeda, responsible for attacks on the World Trade Center in New York and the London Underground, has profited from sales of diamonds originating in Kenya, Tanzania, Liberia, and Sierra Leone. Both al Qaeda and the terror group Hezbollah have used rough diamonds as a means of funding terror cells; to hide money targeted by financial sanctions; to launder the profits of criminal activity; and to convert cash into a commodity that holds its value and is easily transportable.³⁶ According to the US State Department, smuggled and illicit conflict

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33. Martin Donohoe, *Causes and Health Consequences of Environmental Degradation and Social Injustice*, 56 Soc. Sci. & Med. 573–587 (2003); Martin T. Donohoe, *The Roles and Responsibilities of Medical Educators, Ethicists and Humanists in Confronting the Health Consequences of Environmental Degradation and Social Injustice* (2007) (unpublished manuscript, on file with Health and Human Rights).
 34. PHYSICIANS FOR HUMAN RIGHTS, *WAR-RELATED SEXUAL VIOLENCE IN SIERRA LEONE: A POPULATION-BASED ASSESSMENT 1–2*, 17–22 (2002), available at <http://physiciansforhumanrights.org/library/documents/reports/sexual-violence-sierra-leone.pdf>; Stanton, *Econ-Atrocity*, *supra* note 32. See also World Diamond Council, *What are Conflict Diamonds?: Background*, available at <http://www.diamondfacts.org/conflict/background.html>; United Methodist Committee on Relief, *Do You Know Where Your Diamond Has Been?*, available at <http://gbgm-umc.org/UMcor/emergency/conflictdiamonds.stm>; United Methodist Committee on Relief, *Diamonds Fund Cycle of Violence in Africa*, available at <http://gbgm-umc.org/UMcor/stories/doyouknow.stm>.
 35. HUMAN RIGHTS WATCH, *CHILDREN'S RIGHTS: CHILD SOLDIERS* (2004), available at <http://www.hrw.org/campaigns/crp/index.htm>; HUMAN RIGHTS WATCH, *SOWING TERROR: ATROCITIES AGAINST CIVILIANS IN SIERRA LEONE* (1998), available at <http://www.hrw.org/reports98/sierra>; Hans Veeken, *Sierra Leone: People Displaced because of Diamonds*, 309 BRIT. MED. J. 523 (1994); GLOBAL WITNESS & PARTNERSHIP AFRICA CANADA, *supra* note 30, at 6; Stanton, *Econ-Atrocity*, *supra* note 32.
 36. Greg Campbell, *Blood Diamonds*, *Amnesty International Magazine* (Fall 2002), available at http://www.amnestyusa.org/Fall/Blood_Diamonds/page.do?id=1105119&n1=2&n2=19&n3=338; GLOBAL WITNESS, *FOR A FEW DOLLAR\$ MORE: HOW AL QAEDA MOVED INTO THE DIAMOND TRADE* (17 Apr. 2003) at 6–15, 20–27, 28–32, available at http://www.globalwitness.org/media_library_detail.php/109/en/for_a_few_dollars_more.

diamonds may amount to as much as 15 percent of diamond jewelry sold internationally.³⁷

IV. GOLD

A. History

In addition to its aesthetic value, gold has played a dominant role throughout history in the growth of empires and the evolution of the world's financial institutions.³⁸ In 4000 B.C., cultures in Eastern and Central Europe first used gold to fashion decorative objects. By 1500 B.C., gold had become the recognized standard medium of exchange for international trade. In the mid-1800s, the discovery of gold in California and South Africa led to gold rushes which transformed the economies and demographics of these areas.³⁹

Today the world's top five gold producers are South Africa, the United States, Australia, Indonesia, and China. The approximately 2,500 tons of gold mined each year are valued at \$21 billion.⁴⁰ Approximately 85 percent gets turned into jewelry.⁴¹ Wedding rings typically are made from gold, but throughout history the wedding band has been formulated from a variety of minerals.⁴² As with diamonds, aggressive marketing has played a significant role in popularizing the gold wedding ring.

Because of its special chemical and physical properties (including malleability, ductility, thermal conductivity, durability, and resistance to corrosion), the remaining 10–20 percent of mined gold is used to produce electronics and telecommunications equipment, lasers and optical instruments, aircraft engines, and dental alloys.⁴³ Historically, gold was used by Catherine de Medici and others as a poison, while today it is used to relieve joint pain and stiffness in rheumatoid arthritis patients.

37. UNITED STATES GENERAL ACCOUNTING OFFICE, REPORT TO CONGRESSIONAL REQUESTERS, INTERNATIONAL TRADE: CRITICAL ISSUES REMAIN IN DETERRING CONFLICT DIAMOND TRADE (June 2002), available at <http://www.gao.gov/new.items/d02678.pdf>.

38. World Trust Gold Services, *As Good as Gold: A Standard for the Ages*, available at http://streettracksgoldshares.com/pdf/history_of_gold.pdf.

39. NAT'L MINING ASSN., THE HISTORY OF GOLD, available at http://www.nma.org/pdf/gold/gold_history.pdf; Rebecca Solnit, *The New Gold Rush*—gold mining in Nevada, SIERRA MAGAZINE, Jul.–Aug. 2000, at 86.

40. PAYAL SAMPAT, WORLDWATCH INSTITUTE, SCRAPPING MINING DEPENDENCE (2003).

41. Solnit, *supra* note 39.

42. Matt Jacks, *The History of the Wedding Ring - A Recognizable Symbol of Love*, available at <http://www.thehistoryof.net/history-of-the-wedding-ring.html>.

43. Scott Fields, *Tarnishing the Earth: Gold Mining's Dirty Secret*, 109 ENVIRON. HEALTH PERSPECT. A474 (2001); *Gold Jewelry: From Open Pit to Wedding Band*, WORLDWATCH INSTITUTE, available at <http://www.worldwatch.org/node/1491>.

In the United States, a piece of gold jewelry typically sells for at least four times the value of the gold itself.⁴⁴ Currently three times more gold sits in bank vaults, in jewelry boxes, and with private investors, than is identified in underground reserves.⁴⁵ This is enough gold to meet current consumer demand for seventeen years.⁴⁶

B. The World's Most Deadly Industry

Mining is the world's most deadly industry. Forty workers are killed each day, and scores more injured, in extracting minerals, including gold, from the earth.⁴⁷ Over the last century, tens of thousands have been killed working in mines,⁴⁸ while union-busting and human rights abuses have helped maintain cheap labor forces.⁴⁹

Local communities bear the costs of mining in the form of environmental damage and pollution, loss of traditional livelihoods, long-term economic problems, and deteriorating public health.⁵⁰ Hundreds of thousands of people worldwide have been uprooted to make room for gold mining projects.⁵¹ Just as with diamond mining, sexually-transmitted diseases (including HIV/AIDS) are rampant among the poorly-paid miners in gold mining communities.⁵² Male miners spread these diseases to their spouses upon periodic return visits to their home communities.⁵³

C. The Resource Curse

Dependence upon gold mining slows and even reduces economic growth while increasing poverty and encouraging governmental corruption, a phenomenon that economists have dubbed "the resource curse."⁵⁴ With increasing dependence on gold exports comes a slower per capita growth rate.

44. *Gold Jewelry: From Open Pit to Wedding Band*, WORLDWATCH INSTITUTE, available at <http://www.worldwatch.org/node/1491>.

45. SAMPAT, *supra* note 40.

46. *Id.*

47. *Id.*

48. *Id.*

49. EARTHWORKS & OXFAM AMERICA, *DIRTY METALS: MINING, COMMUNITIES AND THE ENVIRONMENT* 26 (2004), available at <http://www.nodirtygold.org/pubs/DirtyMetals.pdf>.

50. EARTHWORKS & OXFAM AMERICA, *supra* note 49.

51. SAMPAT, *supra* note 40.

52. Catherine Campbell & Brian Williams, *Beyond the Biomedical and Behavioural: Towards an Integrated Approach to HIV Prevention in the Southern African Mining Industry*, 48 *SOC. SCI. MED.* 1624, 1626 (1999).

53. SAMPAT, *supra* note 40.

54. *Id.* at 120.

The benefits of gold mining usually go to investors overseas and the central government, with little of the profit passed back to the community.⁵⁵

Rural and indigenous peoples suffer greatly, as they often lack legal title to lands they have occupied for many generations. They may be evicted without prior consultation, meaningful compensation, or the offer of equivalent lands elsewhere. In Tarkwa, Ghana, more than 30,000 people have been displaced by gold mining operations.⁵⁶

Much of the gold mined in the United States is extracted from public lands, the rights to which domestic and foreign mining companies can purchase, under the archaic Mining Law of 1872, for between \$2.50 and \$5.00 per acre.⁵⁷ Government subsidies to the gold mining industry in the United States and abroad provide cheap fuel, road-building, and other infrastructure, as well as reclamation and cleanup. This makes mining highly profitable to the extracting companies, but leaves local communities impoverished and stuck with multi-million to multi-billion dollar costs for environmental cleanup once the companies have moved on.⁵⁸ For example, Galactic Resources, Inc. stuck US taxpayers with a \$200 million bill to clean up the cyanide-poisoned Alamosa River watershed when it declared bankruptcy and walked away from its Summitville gold mine in Colorado in 1992.⁵⁹

Likewise, Nevada's Carlin Trend mining operations have damaged the land of native Western Shoshones.⁶⁰ Nevertheless, the US government has ignored a 2002 ruling of the Inter-American Commission on Human Rights, which held that the United States violated the fundamental rights of the Western Shoshones to property, due process, and equality under the law.⁶¹ Similarly, Spirit Mountain, a sacred site of the Assinboine and Gros Ventre tribes of Montana, was polluted by the Zortman-Landusky open-pit, cyanide-leach gold mine after its residents were forced by the US government to abandon the area. Zortman-Landusky was closed in 1998, when its owner, Pegasus Gold, declared bankruptcy.⁶²

Nearly one-quarter of active gold mining and exploration sites overlap with regions of high conservation value, such as National Parks and World Heritage sites.⁶³ In the United States, only a \$65 million government buy-out prevented Crown Butte Mining Resources, Ltd. from opening a gold,

55. *Id.*

56. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 18.

57. U.S. Public Interest Research Group, Campaign to Cut Polluter Pork (2002), *available at* <http://www.pirg.org/enviro/pork/index.htm>.

58. SAMPAT, *supra* note 40; EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 29.

59. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 29.

60. *Id.* at 16.

61. *Id.* at 23.

62. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 22.

63. *Id.* at 15.

silver, and copper mine just four kilometers (2.5 miles) from the border of Yellowstone, the world's oldest national park.⁶⁴

D. Gold = Cyanide + Mercury

"The gold produced for a single, .33 ounce, 18 karat gold ring leaves in its wake at least eighteen tons of mine waste."⁶⁵ Gold is leached from ore using cyanide. Waste ore and rock leach cyanide and other toxic metals, contaminating groundwater and sometimes sitting in large toxic lakes held in place by tenuous dams.⁶⁶ When the tailings dam at the Omai gold mine in Guyana (one of the largest open-pit mines in the world) failed in 1995, the release of three billion cubic liters of cyanide-laden tailings into the Omai River rendered the downstream thirty-two miles, home to 23,000 people, an "Environmental Disaster Zone."⁶⁷ In 2000, the tailings dam from the Baia Mare gold mine in Romania spilled 100,000 metric tons of toxic wastewater, killing fish, harming fish-eating animals such as otters and eagles, and poisoning the drinking water of 2.5 million people in the Danube River watershed.⁶⁸ Gold mine-related coastal dumping in other areas damages estuaries and coral reefs.⁶⁹

The "Amazonian Gold Rush," which began in the late 1970s, has resulted in the release of at least 2,000 tons of mercury, used to capture gold particles as an amalgam, into local waterways.⁷⁰ Mercury is converted to methylmercury in the environment, leading to elevated levels of methylmercury in the locals' predominantly fish-based diet. Exposure to methylmercury causes decreases in neurocognitive function and memory in local children, who are exposed pre- and post-natally.⁷¹ Both adults and children develop sensory disturbances, tremors, and balance problems.⁷² Some have been

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64. No Dirty Gold, Threatened Natural Areas, available at http://www.nodirtygold.org/threatened_natural_areas.cfm; EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 14–15.
65. *Gold Jewelry: From Open Pit to Wedding Band*, *supra* note 44.
66. Ronald Eisler & Stanley N. Wiemeyer, *Cyanide Hazards to Plants and Animals from Gold Mining and Related Water Issues*, 183 REV. ENVTL. CONTAMINATION & TOXICOL. 21 (2004); EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 2, 9.
67. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 5.
68. *Id.* at 29.
69. *Id.* at 6.
70. Fields, *supra* note 43, at A478.
71. Phillipe Grandjean, Roberta F. White, Anne Nielsen, David Cleary & Elisabeth C. de Oliveira Santos, *Methylmercury Neurotoxicity in Amazonian Children Downstream from Gold Mining*, 107 ENVIRON. HEALTH PERSPECT. 587 (1999); Ana Amelia Boischio & Diane S. Henshel, *Risk Assessment of Mercury Exposure through Fish Consumption by the Riverside People in the Madeira Basin, Amazon, 1991*, 17 NEUROTOXICOLOGY 169 (1996); *Id.*, at 169–175.
72. Masazumi Harada, et al., *Mercury Pollution in the Tapajos River Basin, Amazon: Mercury Level of Head Hair and Health Effects*, 27 ENVIRONMENT INTL. 285, 285 (2001).

diagnosed with mild Minamata Disease,⁷³ a form of methylmercury poisoning originally described in heavily-fished Minamata Bay, Japan, where the Chisso Corporation dumped large amounts of methylmercury in the mid-twentieth century.⁷⁴ In the United States, fish in the Sacramento River and San Francisco Bay still show elevated levels of mercury, acquired in part as a result of the nineteenth century Gold Rush. During the Gold Rush, about 7,600 tons of mercury, which was used instead of cyanide to purify gold, entered California's lakes, streams, and rivers, and San Francisco Bay just from mining in the central mother lode.⁷⁵

Mercury pollution also has contributed to the spread of malaria. Mercury may lower immunity to malaria; still pools of water resulting from mining serve as breeding grounds for malaria-carrying mosquitos; and miners from other areas import new strains of the disease, to which indigenous peoples have not built up immunity. Such strains of malaria contributed to the deaths of thousands of Yanomami Indians in Brazil in the late 1960s and early 1970s.⁷⁶

E. Other Environmental Harms

Once gold is extracted, its processing continues to harm the environment. Gold smelting uses large amounts of energy and releases 142 tons of sulfur dioxide annually (13 percent of the world's total output), along with nitrogen dioxide and other components of air pollution and acid rain. Chronic asthma, skin diseases, and lead poisoning are common ailments found in those who live and work in mining communities.⁷⁷

The United States Environmental Protection Agency estimates that 40 percent of Western US watersheds are affected by gold mining pollution. There are more than twenty-five mines, some of them active, on the US Superfund list (meaning that they are among the most contaminated areas in the country).⁷⁸ Mine pollution ruins farmlands and strains local food

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73. Martin Lodenius & Olaf Malm, *Mercury in the Amazon*, 157 REV. ENVTL. CONTAMINATION & TOXICOL. 25, 46 (1998).
74. Pamela Paradis Powell, *Minamata Disease: A Story of Mercury's Malevolence*, 84 SOUTHERN MED. J. 1352 (1991); M. Harada, *Minamata Disease: Methylmercury Poisoning in Japan Caused by Environmental Pollution*, 25 CRITICAL REV. TOXICOL. 1 (1995). Minamata Disease was documented with great poignancy in an award-winning photo-essay by William Eugene Smith & Aileen Mioko Sprauge Smith & Ishikawa Takeshi, available at <http://www.geocities.com/minoltaphotography/willameugenesmith.html>.
75. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 9; Solnit, *supra* note 39, at 50–57, 86; Rebecca Solnit, *The New Gold Rush*, SIERRA MAGAZINE 53, Jul.–Aug. 2000, at 54.
76. Fields, *supra* note 43, at A481.
77. EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 8; *Gold Jewelry: From Open Pit to Wedding Band*, *supra* note 44.
78. Fields, *supra* note 43, at A475.

resources. Open-pit gold mines also have led to water table declines of as much as 300 meters, a consequence of the enormous quantities of water which must be pumped into the ore to release the mineral.⁷⁹

F. Women and Children Last

Water pollution in the developing world forces women, who are predominantly responsible for water collection, to walk increasing distances to find potable water. By displacing agriculture, a field in which women play a major role, gold mining removes women from the labor force and concentrates economic power in the hands of men, which in turn diminishes the financial resources and educational, political, and legal opportunities of women. Those few women who obtain low-level clerical positions at mines often face severe discrimination and sexual harassment, and may be fired if they become pregnant. Gold mines also frequently utilize child labor.⁸⁰

G. Human Rights Abuses and Terrorism

Just as diamonds have been linked with monies for terrorism, so has gold mining. Allan Laird, a former executive of Echo Bay Mines Limited, told ABC News that the company paid off the militant Islamist separatist group Abu Sayyaf, which is affiliated with al Qaeda, in exchange for protection of the company's gold mine in the Philippines.⁸¹

The Grasberg gold mine, the largest in the world, is owned by US-based Freeport McMoRan. Situated on land seized from the Amunge and Kamoro people, it dumps 110,000 tons of cyanide-laced waste into local rivers each day. Its operators have been implicated in human rights violations, including forced evictions, murders, rape, torture, extra-judicial killings, and arbitrary detentions, abetted by the Indonesian military, which Freeport McMoRan has paid millions of dollars.⁸²

79. EARTHWORKS & OXFAM AMERICA *supra* note 49, at 12; Solnit, *supra* note 39.

80. Raul Harari, Francesco Forastiere, & Olav Axelson, *Unacceptable "Occupational" Exposure to Toxic Agents among Children in Ecuador*, 32 AM. J. INDUSTRIAL MED. 185, 186 (1997); EARTHWORKS & OXFAM AMERICA, *supra* note 49, at 25.

81. Marilyn Berlin Snell, *The Cost of Doing Business*, SIERRA MAGAZINE, May/June 2004, available at http://www.sierraclub.org/sierra/200405/terrorism/printable_all.asp.

82. EARTHWORKS & OXFAM AMERICA, DIRTY METALS, *supra* note 49, at 14, 19, 24.

H. Markets versus Morals

To maintain the status quo, the mining industry maintains strong ties with governments, including the United States, where industry lobbyists contributed almost \$21 million to US political campaigns between 1997 and 2001.⁸³ Gold mining subsidies in many countries make it cheaper to extract new gold than to recycle existing gold.⁸⁴

Recent proposals to cancel the crushing debts of the poorest countries to the International Monetary Fund (IMF) and World Bank require the sale of IMF gold as a component of the debt forgiveness package. However, despite an IMF plan that would ensure IMF gold sales have no net impact on the world gold market, the gold industry is blocking the debt forgiveness agreement.⁸⁵

V. ALTERNATIVES AND SOLUTIONS

A. Flowers

In the 1990s, in response to boycotts in Germany and increased consumer awareness, Europeans devised a series of voluntary eco-labels, none of which were particularly effective.⁸⁶ These did not take hold with American consumers. Several non-governmental organizations are working to develop voluntary standards relating to cut flowers produced in a humane, ecologically-sustainable manner. The FoodFirst Information and Action Network, as part of its "Flower Campaign," has issued an "International Code of Conduct" urging the floriculture industry to conform to International Labor Organization standards, the United Nations Declaration of Human Rights, and basic environmental standards.⁸⁷ Many businesses have yet to adopt the code. Nevertheless, purchasers of flowers can purchase locally- or internationally-produced, organically-grown, labor-friendly bouquets (e.g., at some Whole Foods Market natural and organic food chain stores or through www.organicbouquet.com), or grow and pick their own.

Recently, activist Gerald Prolman, working with growers in the United States and Latin America, seed suppliers, and supermarkets, has developed the Veriflora certification system. The basic principles of Veriflora are: organic

83. SAMPAT, *supra* note 40, at 126.

84. SAMPAT, *supra* note 40, at 114.

85. Russel Mokhiber & Robert Weissman, *Sell the Gold, Free the Poor*, 1 Jun. 2005, available at <http://lists.essential.org/pipermail/corp-focus/2005/000205.html>.

86. Wehner, *supra* note 5, at 19–20.

87. Tenenbaum, *supra* note 1, at A247.

production with phase out of pesticides, fair labor practices, water conservation, safe waste management, fair wages, overtime pay, and the workers' right to organize. Veriflora certification also requires companies to mitigate any environmental damage they may have caused in the past. Unannounced audits will ensure compliance. The Society of American Florists has not yet endorsed Veriflora. While supermarkets account for only 29 percent of overall flower sales in the United States (versus 47 percent for florists), supermarkets have been gaining market share steadily at the expense of florists. Because there are just fifty major supermarket companies (versus 1,200 wholesalers and 30,000 florists), Prolman is focusing his efforts more on supermarkets. Consumer education and pressure on supermarkets and florists, including querying managers, boycotts, and protests, might lead to more rapid adoption of environmentally- and socially-sound production practices among their suppliers.⁸⁸

B. Diamonds

To the traditional queries of diamond purchasers—cut, color, clarity, and carat weight—should be added a fifth: conflict. Buyers should avoid purchasing diamonds that jewelers cannot certify as conflict-free. Alternatives to diamonds include cubic zirconium and synthetic (or cultured) diamonds, produced by General Electric (a company with a record of environmental, labor, and human rights abuses) and De Beers (which has been charged and fined for anti-trust activities in the United States), as well as Gemesis Corporation and Apollo Diamond, Inc.⁸⁹ Such alternatives' only "flaw" is their slightly yellow hue.⁹⁰ Another company, LifeGem, creates diamonds from carbon captured during the cremation of human and animal remains.⁹¹

The diamond industry and the United Nations General Assembly have lent their support to a system of rough controls, the Kimberley Process Certification Scheme, to protect legitimate diamonds and isolate "blood diamonds" from the international market.⁹² Governments would license miners; diamond traders would export their goods in sealed, tamper-proof containers;

88. Scientific Certification Systems, The Veriflora Certification System, available at http://www.scscertified.com/csrpurchasing/veriflora/docs/VeriFlora_FAQ.pdf; Wehner, *supra* note 5.

89. Martin T. Donohoe, *GE—Bringing Bad Things to Life: Cradle to Grave Health Care and the Unholy Alliance between General Electric Medical Systems and New York-Presbyterian Hospital*, 41 *SYNTHESIS/REGENERATION* 31–33 (2006).

90. Sanjiv Arole, *Cultured Diamonds are Here to Stay*, REDIFF.COM, 31 Mar. 2004, available at <http://inhome.rediff.com/money/2004/mar/31guest.htm>.

91. Carly Wickell, *Jewelry/Accessories: Creating Diamonds from Human Ashes*, ABOUT.COM, available at http://jewelry.about.com/cs/syntheticdiamonds/a/lifegem_diamond.htm.

92. PHYSICIANS FOR HUMAN RIGHTS, *supra* note 34.

and interlocking computer databases in exporting and importing countries would catch discrepancies. For such controls to be successful, countries involved in cutting and finishing diamonds (primarily Belgium, India, and Israel) and the major importers of cut diamonds and jewelry (such as the United States) would have to enact strict customs regulations, backed by thorough inspections and harsh penalties against rogue importers.⁹³

In the United States, the Clean Diamonds Trade Act of 2003 mandates participation in the Kimberley Process Certification scheme by requiring that all countries exporting diamonds to the United States have in place these rough controls. Money from fines (up to \$10,000 for civil and \$50,000 for criminal penalties) and seized contraband is earmarked for assistance of victims of armed conflict.⁹⁴

Despite the diamond industry's stated commitment to a system of self-regulation to prevent trade in conflict diamonds, Amnesty International and Global Witness recently found that fewer than one in five companies responding in writing to their survey were able to provide a meaningful account of their policies, and less than half of diamond jewelry retailers visited were able to give consumers meaningful assurances that their diamonds were conflict-free.⁹⁵

Those who decide to purchase diamonds should query their jewelers aggressively and demand documentation of the diamonds' conflict-free status. As with flowers, consumer education, boycotts, and protests could lead to more rapid changes in the diamond industry.

C. Gold

Consumers can take the "No Dirty Gold" pledge to demand an alternative to gold that was produced at the expense of communities, workers, and the environment. The "No Dirty Gold" campaign, online at http://www.nodirtygold.org/take_action.cfm, asks that mining companies not operate in areas of armed or militarized conflict, and calls on jewelry and other retailers to not use gold that comes from conflict areas or involves human rights violations.⁹⁶

93. *Id.*

94. 19 U.S.C. 3901; GLOBAL WITNESS & PARTNERSHIP AFRICA CANADA, THE KEY TO KIMBERLEY: INTERNAL DIAMOND CONTROLS: SEVEN CASE STUDIES (22 Oct. 2004), available at http://www.globalwitness.org/media_library_detail.php/126/en/the_key_to_kimberley.

95. Press Release, Amnesty International & Global Witness, Déjà Vu: Diamond Industry Still Failing to Deliver on Promises, AI Index POL 34/008/2004, 18 Oct. 2004, available at [http://web.amnesty.org/library/pdf/POL340082004ENGLISH/\\$File/POL3400804.pdf](http://web.amnesty.org/library/pdf/POL340082004ENGLISH/$File/POL3400804.pdf).

96. *Gold Jewelry: From Open Pit to Wedding Band*, supra note 44.

Earlier this year, eleven of the world's top jewelry retailers pledged to move away from "dirty gold" sales and called on mining corporations to ensure that gold is produced in more socially and environmentally responsible ways. The eleven firms are Zale Corporation, the Signet Group (the parent firm of Sterling and Kay Jewelers), Tiffany and Company, Helzberg Diamonds, Fortunoff, Cartier, Piaget, Fred Meyer Jewelers, Van Cleef and Arpels, TurningPoint, and Michael's Jewelers. Leading firms cited as "lagging behind" on commitments to responsible gold sourcing are Rolex, JC Penney, Wal-Mart, Whitehall Jewelers, Jostens, QVC, and Sears/K-Mart.⁹⁷

Students can boycott class ring sales and marrying couples can consider other visible tokens of their shared commitment. Shareholders in mining companies can push an activist agenda through resolutions and protests at annual stockholders' meetings. Continued consumer pressure on retail outlets and governments to eschew dirty gold ultimately may lead to a system similar to the Kimberley Process. The International Labor Organization's Convention No. 169 Concerning Indigenous and Tribal Peoples in Independent Countries, which has been signed and ratified by seventeen countries, requires governments to allow for a culturally-relevant system of consultation before indigenous lands are appropriated for mining, and that indigenous peoples participate in the benefits of such mining.⁹⁸ None of the top gold mining countries have ratified this treaty.⁹⁹ Finally, mining companies and governments should invest more money to develop biological and chemical treatments to decrease or destroy the cyanide in gold mill effluents, particularly for use in the developing world.¹⁰⁰

VI. ALTERNATIVE TOKENS OF AFFECTION

Consumers should reconsider the entire concept of purchasing cut flowers, gold and diamonds as symbols of their affection. These symbols are not universal and have not been constant throughout history, but rather are cultural constructs extensively perpetuated by the persuasive marketing efforts

97. *The Golden Rules*, NO DIRTY GOLD, available at <http://www.nodirtygold.org/goldenrules.cfm>; *Retailers who Support the Golden Rules*, NO DIRTY GOLD, available at http://www.nodirtygold.org/supporting_retailers.cfm.

98. Convention (No. 169) concerning Indigenous and Tribal Peoples in Independent Countries, adopted 27 June 1989, ILO, General Conf., 76th sess. (entered into force 5 Sep. 1991), available at <http://www.unhchr.ch/html/menu3/b/62.htm> (Office of the United Nations High Commissioner for Human Rights); EARTHWORKS & OXFAM AMERICA, DIRTY METALS, *supra* note 49.

99. Int'l Labor Org., *Ratifications of ILO Convention, No. C169*, (3 Oct. 2007), available at <http://www.ilo.org/ilolex/cgi-lex/ratific.pl?C169>.

100. Ata Akcil, *Destruction of Cyanide in Gold Mill Effluents: Biological versus Chemical Treatments*, 21 BIOTECHNOLOGY ADVANCES 501 (2003).

of multinational corporations. The visible reminders of one's love should not also represent environmental destruction, violence, the subjugation of native peoples, child labor, and human rights abuses.

Substitute gifts include cards (ideally printed on recycled paper), poems, photos, collages, videos, art, home improvement projects, homemade meals, and donations to charities. Consider alternatives to the traditional diamond engagement and gold wedding rings, such as recycled or vintage gold: old gold can be melted down and made into new jewelry. Other options include eco-jewelry made from recycled or homemade glass and coconut beads.¹⁰¹ Purchasing handicrafts constructed by indigenous peoples from outlets that return the profits to the artisans and their communities provides wide-ranging social and economic benefits. Such tokens of affection will be rendered more meaningful through their lack of association with death and destruction and because they symbolize justice and hope for the future.

101. Katherine Kerlin, *Diamonds Aren't Forever: Environmental Degradation and Civil War in the Gem Trade*, *THE ENVIRONMENTAL MAGAZINE* (2004), available at <http://www.emagazine.com/view/?1078>.