重建世界—基因工程引起的倫理問題《續》

Redesigning the World: Ethical Questions about Genetic Engineering (continued)

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當美國的克林頓總統閱讀了有關基因工程被用於生物戰爭的危險之後，極表關切，並在一九九八年春將民防因應措施列爲一項當務之急；然而，他的行政部門，除了最基本的生物科技工業安全規則與限制條款之外，對其餘的一概反對。這樣一來，克林頓在無形之中造成了一種趨勢，即本欲防範之武器製造，變成更容易爲他國及恐怖份子所取得。（註27）

After reading about the dangers of genetic engineering in biowarfare, the president of the United States, Bill Clinton, became extremely concerned, and, in the spring of 1998, made civil defense countermeasures a priority. Yet, his administration has systematically opposed all but the most rudimentary safety regulations and restrictions for the biotech industry. By doing so, Clinton has unwittingly created a climate in which the production of the weapons he is trying to defend against has become very easy for both governments and terrorists.[27]

植物

新的作物可以與野生的近親繁殖，或與相近的品種交叉繁殖。「外來」基因可能散佈到環境各處，造成無法預期，一發不可收拾的改變。作物與野生植物可能產生全新的疾病。被設定作爲攜帶外來基因進入其他生物的，是可超越品種間「藩籬」及壓制生物天然防禦措施的濾過性病原體，這使得它們比天然存在的寄生菌更具傳染性，任何新的濾過性病原體也因此比已知的品種更具威力。

普通雜草可能成爲「超級雜草」：植物被改造成抗除草劑後，可能因爲太過侵略性，自己反變成雜草；或者它們可能將抗藥力傳給野生雜草，使之更具侵略性。脆弱的植物可能被逼得絕種，進而削弱了大自然珍貴的生態多樣化。昆蟲可能無從控制；在令植物抗拒化學毒藥的同時，如果害蟲也承受了對殺蟲劑的抵抗力，則可能引起「超級害蟲」的危機。（註28）

Plants

New crops may breed with wild relatives or cross breed with related species. The "foreign" genes could spread throughout the environment causing unpredicted changes which will be unstoppable once they have begun. Entirely new diseases may develop in crops or wild plants. Foreign genes are designed to be carried into other organisms by viruses which can break through species barriers, and overcome an organism's natural defenses. This makes them more infectious than naturally existing parasites, so any new viruses could be even more potent than those already known.

Ordinary weeds could become "Super-weeds": Plants engineered to be herbicide resistant could become so invasive they would be a weed problem themselves, or they could spread their resistance to wild weeds, making them more invasive. Fragile plants may be driven to extinction,

除草劑與殺蟲劑對鄉村的危害可能更甚：由於農人將可無所忌憚地使用這些有毒的化學劑，它們的使用量可能會增加，加重水質污染與土質惡化的威脅。

植物被培育成能自我產生殺蟲劑後，可能會害及無辜，例如鳥、蛾、蝴蝶等。包括基因科學家在內，沒有人確實知道釋放出新生命形態對環境可能造成的後果。他們知道上述這一切是可能的，而且是無法逆轉的，但是他們仍要貫徹他們的實驗。落在他們腰包裡的是鉅富；落在我們手裡的卻是一個吉凶未卜的新世界－－我們熟悉的世界早已隨風而去了。（註29）

附註：

27. 威廉・柏萊德（William T. Broad）與茱蒂絲・米勒（Judith Miller）合著，刊載於一九九八年八月七日《紐約時報》的「細菌防衛計劃因被揭弊而陷入危機」一文。亦見溫蒂・包納碧（Wendy Barnaby）著、登載於一九九七年六/七月刊《基因道德》第十八期的「生物武器與基因工程」一文。

28. 原文爲「對除草劑的抵抗力」，但顯然是「對殺蟲劑的抵抗力 」。

29.「我們熟悉的世界的結束：環境爲基因工程所付的代價」 http://www.greenpeace.org/~comms/cbio/brief2.html。

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reducing nature's precious biodiversity. Insects could be impossible to control. Making plants resistant to chemical poisons could lead to a crisis of "super pests" if they also take on the resistance to pesticides.[28]

The countryside may suffer even greater use of herbicides and pesticides. Because farmers will be able to use these toxic chemicals with impunity, their use may increase, threatening more pollution of water supplies and degradation of soils. Plants developed to produce their own pesticide could harm non-target species such as birds, moths and butterflies. No one—including the genetic scientists—knows for sure the effect that releasing new life forms will have on the environment. They do know that all of the above scenarios are possible and irreversible, but they still want to carry out their experiment. THEY get giant profits. All WE get is a new and uncertain environment—an end to the world as we know it.[29]

NOTES:

27. William J. Broad and Judith Miller, "Germ Defense Plan in Peril as Its Flaws Are Revealed" (*NY Times*, August 7, 1998). See also Wendy Barnaby, "Biological Weapons and Genetic Engineering" (*GenEthics News*, Issue 18, June/July 1997).

28. The original says "resistance to herbicides" but "resistance to pesticides" is clearly meant.

29. "THE END OF THE WORLD AS WE KNOW IT: The Environmental Costs of Genetic Engineering" <http://www.greenpeace.org/~comms/cbio/brief2.html>.

ᘐTo be continued

◎基因工程--帶來一個吉凶未卜的新世界
◎Genetic engineering will bring us a new and uncertain environment.