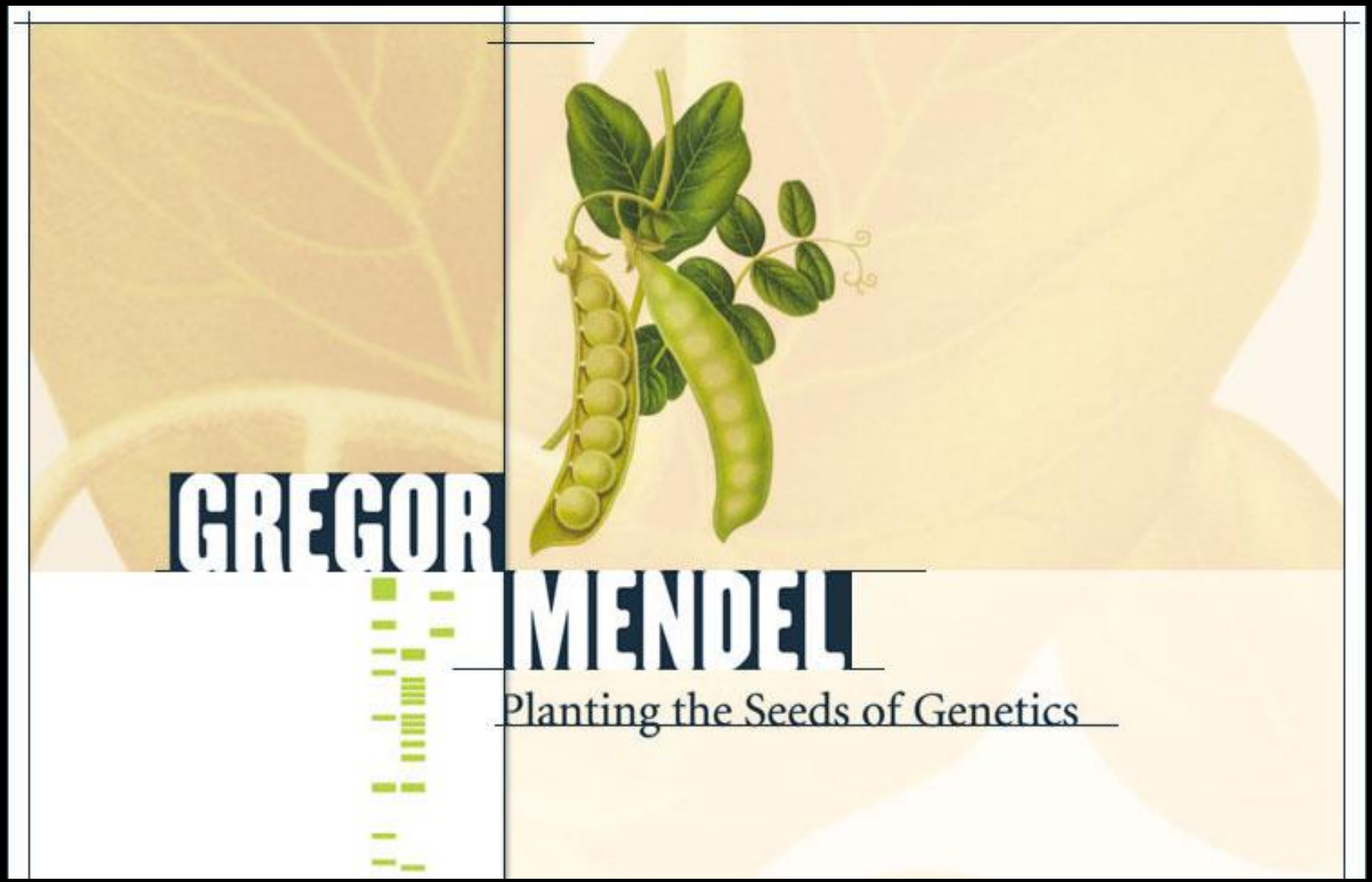
Biotechnology & Art
HC 177
FOOD: nourishment


Australia's favourite fries.



Gregor **Mendel** (left), in the 1850s made the first observation that plant traits are inherited. Mendel noticed that when green and yellow peas were crossed, all progeny seeds were yellow. When plants of this first hybrid generation (F1) were allowed to self-pollinate, the progeny (F2) segregated
with one green seed per three yellow (right).

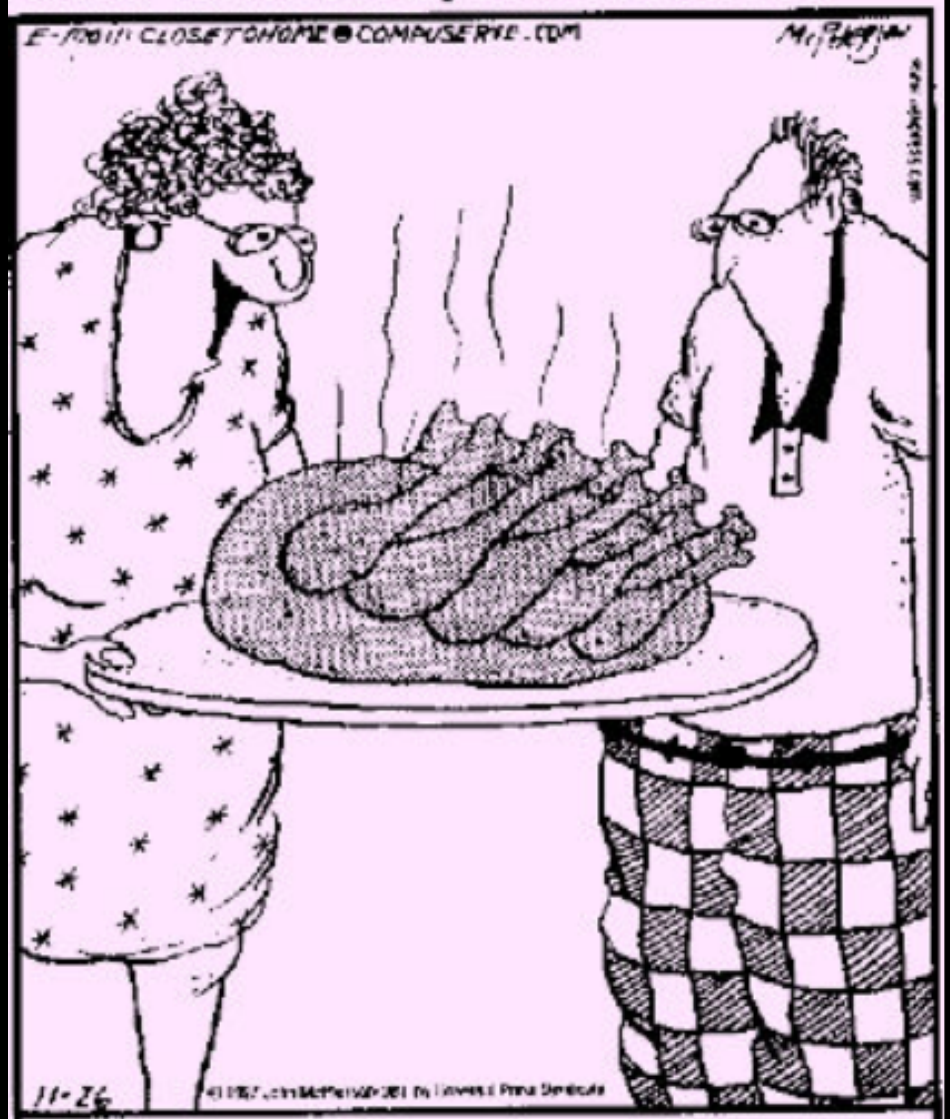
In 1863, Austrian botanist Gregor Mendel discovered that pea plants passed on traits from parent to progeny in discrete biological units that would be later known as genes. Six years later, Swiss biochemist Johann Friedrich Miescher isolated from white blood cells the substance that would be called deoxyribonucleic acid, or DNA.

It would be another 75 years before the two discoveries were linked. In 1944, Canadian biologist Oswald Avery suggested that DNA was the mechanism by which bacteria passed on their hereditary material. However, Avery's explanation was met with skepticism by those who believed that the genetic information of an organism was far too complex to be contained in DNA.

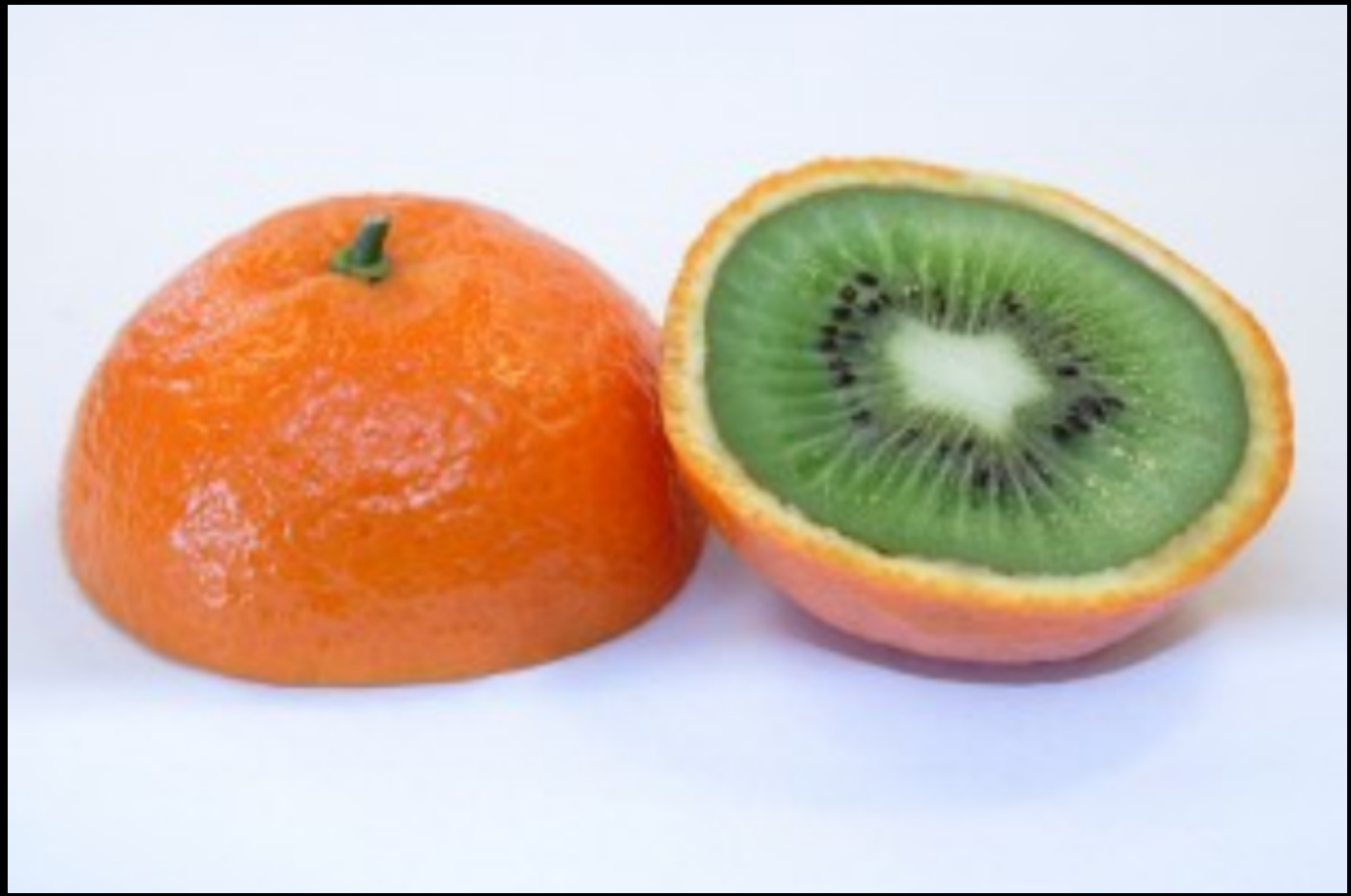
Then in 1953, American biologist James Watson and British molecular biologist Francis Crick determined the double-helix structure of DNA, which, in turn, led to a cascade of new discoveries of how DNA works at a molecular level.

These discoveries were advancements only in the field of biochemistry. It was not until 1972 that scientists pioneered a way to combine biochemistry with a technique hat led to the birth of biotechnology. That was the year that American biochemists Herbert Boyer, Paul Berg, and Stanley Cohen developed recombinant DNA, a modified DNA molecule created by combining DNA from two unrelated organisms.

Close to Home By John McPherson



"Isn't genetic engineering amazing? Two years ago who would have even imagined such a thing as a Turkipede?!"



PROS:

Pest resistance Crop losses from insect pests can be staggering, resulting in devastating financial loss for farmers and starvation in developing countries.

Herbicide Tolerance: Crop plants genetically-engineered to be resistant to one very powerful herbicide could help prevent environmental damage by reducing the amount of herbicides needed.

Disease resistance There are many viruses, fungi and bacteria that cause plant diseases. Plant biologists are working to create plants with genetically-engineered resistance to these disease

Cold tolerance Unexpected frost can destroy sensitive seedlings. An antifreeze gene from cold water fish has been introduced into plants such as tobacco and potato. With this antifreeze gene, these plants are able to tolerate cold temperatures that normally would kill unmodified seedlings

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PROS continued:

Drought tolerance/salinity tolerance As the world population grows and more land is utilized for housing instead of food production, farmers will need to grow crops in locations previously unsuited for plant cultivation.

Nutrition Malnutrition is common in third world countries where impoverished peoples rely on a single crop such as rice for the main staple of their diet. However, rice does not contain adequate amounts of all necessary nutrients to prevent malnutrition. If rice could be genetically engineered to contain additional vitamins and minerals, nutrient deficiencies could be alleviated. For example, blindness due to vitamin A deficiency is a common problem in third world countries. Researchers at the Swiss Federal Institute of Technology Institute for Plant Sciences have created a strain of "golden" rice containing an unusually high content of beta-carotene (vitamin A)

Pharmaceuticals Medicines and vaccines often are costly to produce and sometimes require special storage conditions not readily available in third world countries.

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CONS:

Unintended harm to other organisms Last year a laboratory study was published in Nature showing that pollen from B.t. corn caused high mortality rates in monarch butterfly caterpillars.

Reduced effectiveness of pesticides

Gene transfer to non-target species: Another concern is that crop plants engineered for herbicide tolerance and weeds will cross-breed, resulting in the transfer of the herbicide resistance genes from the crops into the weeds. These "superweeds" would then be herbicide tolerant as well.

Allergenicity Many children in the US and Europe have developed life-threatening allergies to peanuts and other foods. There is a possibility that introducing a gene into a plant may create a new allergen or cause an allergic reaction in susceptible individuals.

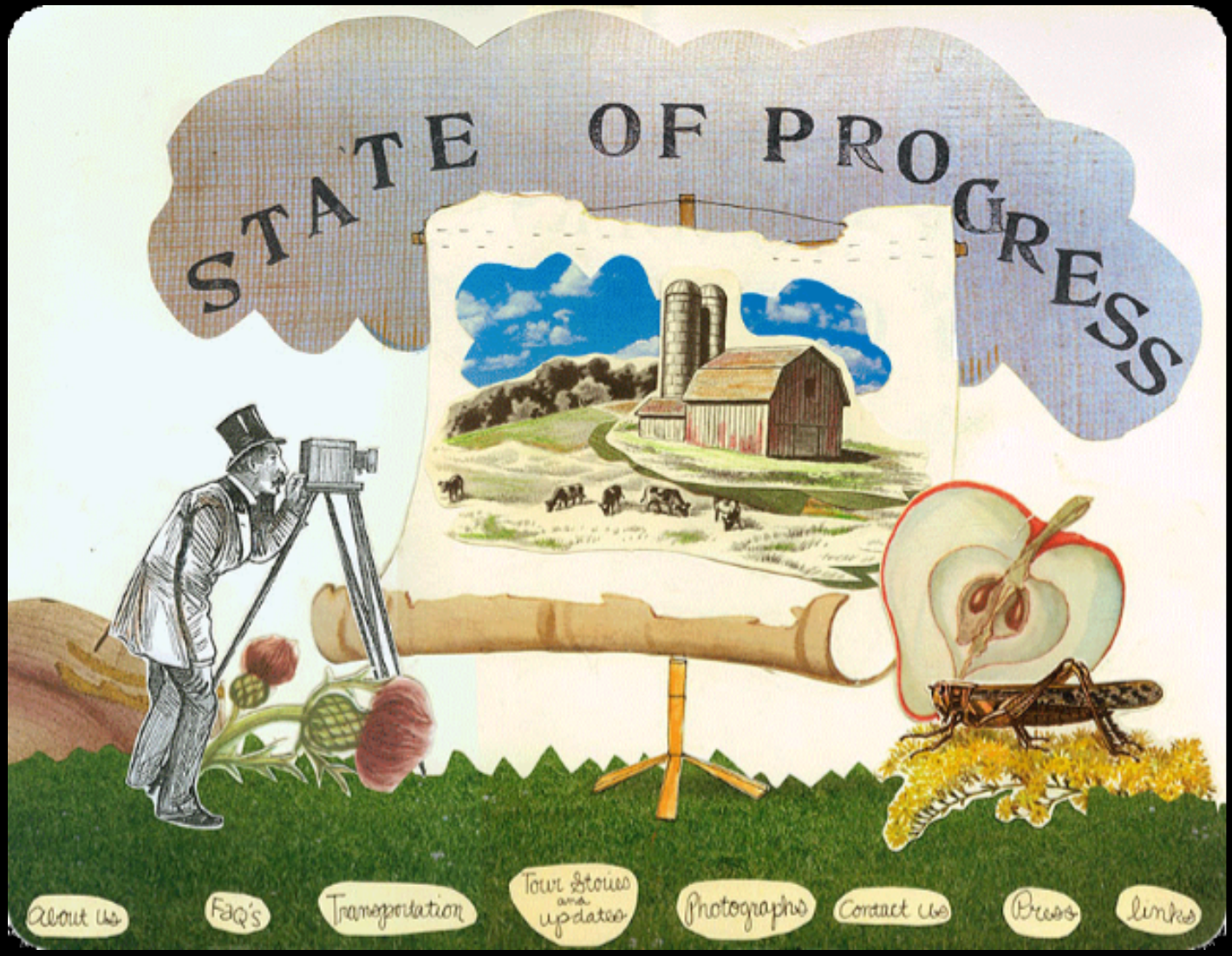
Unknown effects on human health There is a growing concern that introducing foreign genes into food plants may have an unexpected and negative impact on human health.


MONSANTO + MILK ?
THE MIRACLES OF
MONSANTO
c. 1969 Agent Orange
c. 1979 Roundup (herbicide)
c. 1994 rBGH for MILK?


Edible
Estates
GARDENLAB
PROJECT

Martin Brest van Kempen: Living from Land

FALLEN FRUIT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FIELD FARING

KATHRYN MILLER: SEED BOMBS

GEORGE GESSERT

Hybrid 487
(90-36F)
Hybrid 22 (83-7D) x
Hybrid 175 (86-47C)
First bloom 1995
Flower diameter 4"
Stem 16"

Died.

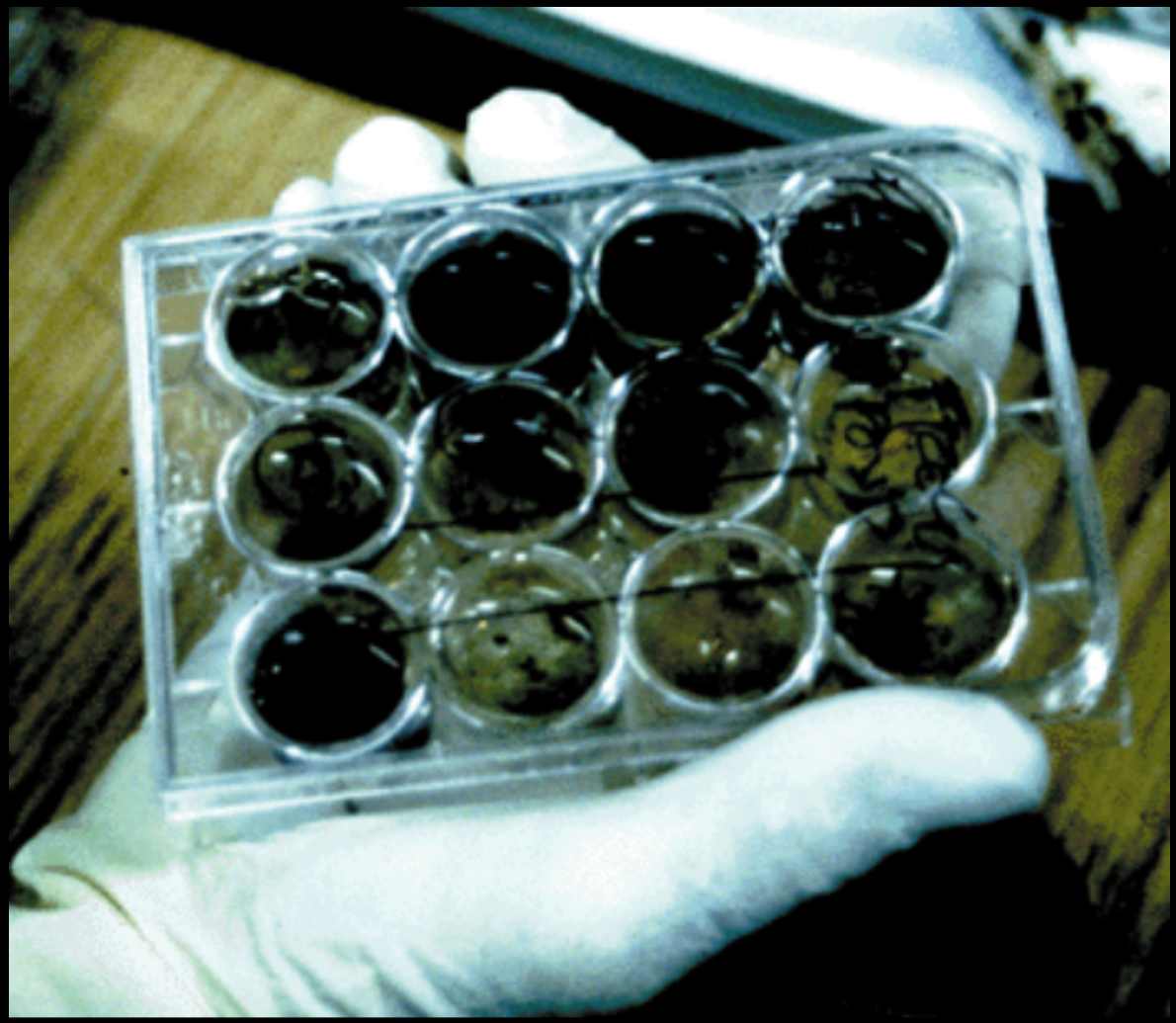
CRITICAL ART ENSEMBLE

STEVE KURTZ

Edward Steichen: photographer in the 1920's

Steichen's hobby was horticulture. He used Colchicines to induce mutations/polyploidy
in Delphiniums and raised five acres of them near his home near West Redding, Connecticut. He would then photograph the resulting genetically modified plants.

Joe
Davis



Mcirovenus - (embed codes in ecoli)