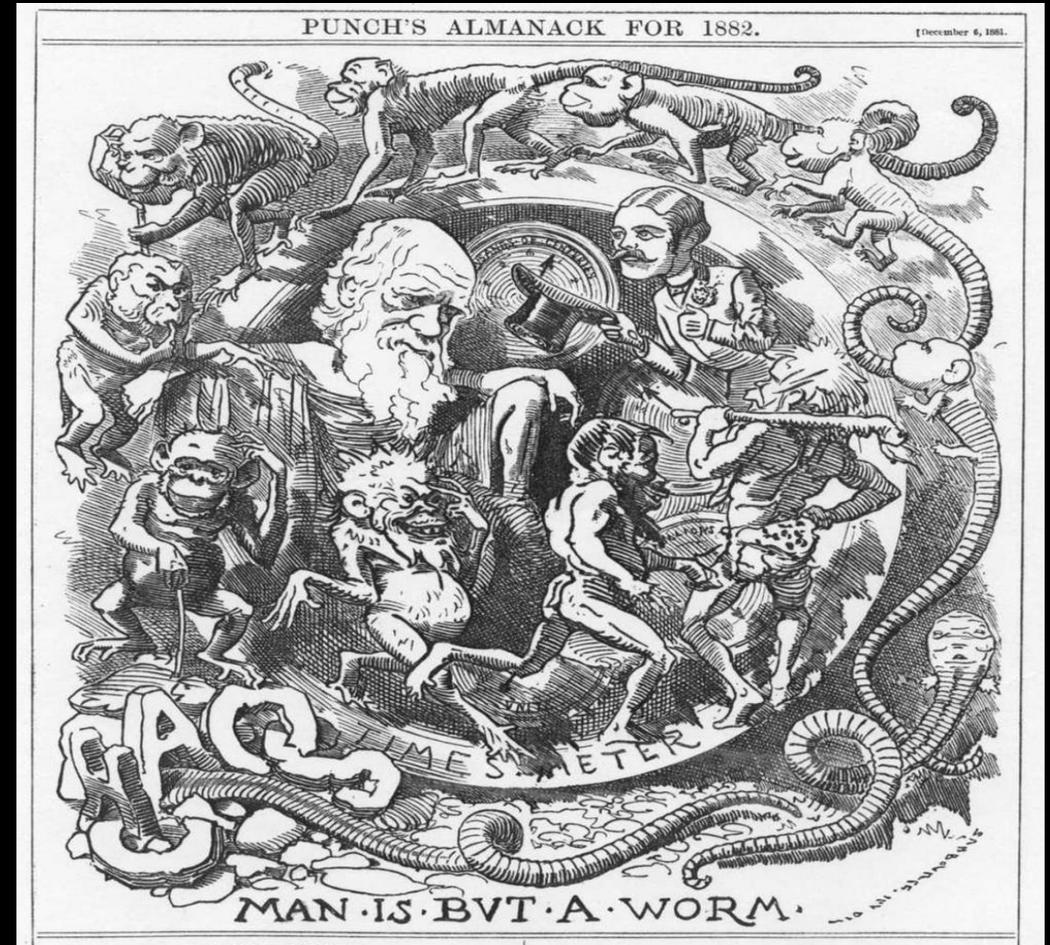


VPAS 7380.001 (87906)
Charles Darwin and the Evolution of Beauty
M-W 4-6:45

Fall 2020
Dr. Charissa N. Terranova
University of Texas at Dallas
Arts & Humanities

Office Hours: Online by appointment
Contact: terranova@utdallas.edu
www.charissaterranova.com

Wednesday September 30
Race, Gender, and the Cultural Fabrications of
Sexual Selection



Wednesday September 30 The Cultural Fabrications of Sexual Selection

- Evelleen Richards, *Charles Darwin and the Making of Sexual Selection* (Chicago: University of Chicago Press)
 - Prologue
 - Chapter Four Beauty Cuts the Knot
 - Chapter Five Reading the Face of Race
 - Chapter Ten Critical Years: From Pigeons to People
- Evelleen Richards, “Darwin and the Descent of Woman,” in *The Wider Domain of Evolutionary Thought*, David Oldroyd and Ian Langham, eds. (London: D. Reidel Publishing Company, 1983) 57-112.

Voyage of the HMS Beagle



is thus rich and sophisticated, synthetic and revisionist. Richards benefits from previous scholarship on Darwin, but has herself delved deep into the notebooks, the printed record, and a wide range of secondary literatures to offer a wealth of discoveries and reinterpretations. Time and again, she guides readers through a passage we may think we know—and demonstrates the transformative power of new evidence and a different approach. Many of the canonical episodes in Darwin studies will never look quite the same again.

s magnum opus demonstrates the fresh insights that sustained and meticulous work, Robin Scheffler, Elena Aronova (Chair)



Winner of the 2018 Suzanne J. Levinson Prize *highlighting a book in the history of life sciences and natural history*

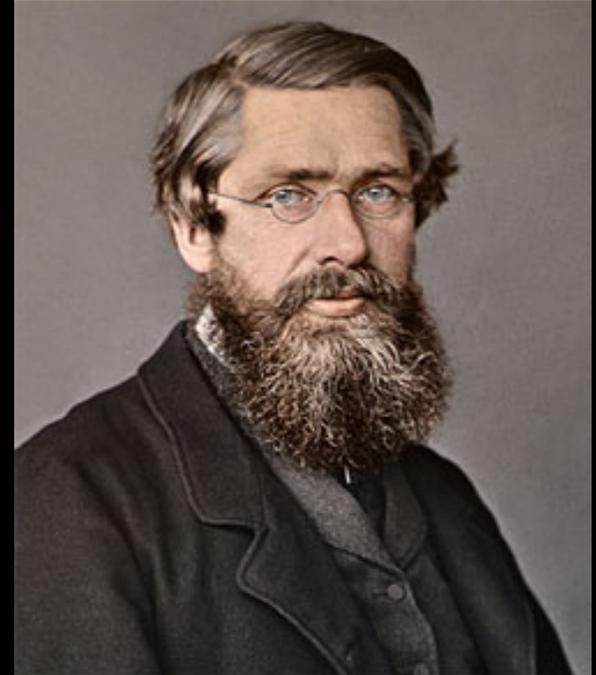
From the website for the History of Science Society

Evelleen Richards (University of Sydney)

In [*Darwin and the Making of Sexual Selection*](#) (University of Chicago Press, 2017) Evelleen Richards offers fresh and thought-provoking perspective on a topic of long-standing interest to historians of biology. This dazzling book transforms our understanding of the genesis of Charles Darwin's theory, and far more generally of the debate over sex and race, evolution and reproduction.

According to the theory of sexual selection, either male combat or female choice drives the evolution of striking sexual dimorphisms, including in those ornamental structures and behaviors that otherwise seem nonadaptive at best. This was Darwin's "secondary" principle, but Richards makes a strong case that sexual selection came first and then gained prominence as he backtracked on the scope of natural selection. Yet, as she shows, sexual selection was always controversial and often unsuccessful; it continually threatened to collapse under the weight of its contradictions. Richards brilliantly explores the mental acrobatics through which Darwin tried to justify female choice in other animals, but preserve male agency in humans. She insists, moreover, that the theory, marked by Darwin's encounter with "savages" in Tierra del Fuego, was also and in some ways primarily about race. Reconstructing his attempt to produce a naturalistic account of beauty, she places aesthetic theory and visual discrimination center-stage, not least in a gripping analysis of his triple analogy among female birds, male pigeon-breeders, and women fashionably decked out in feathers.

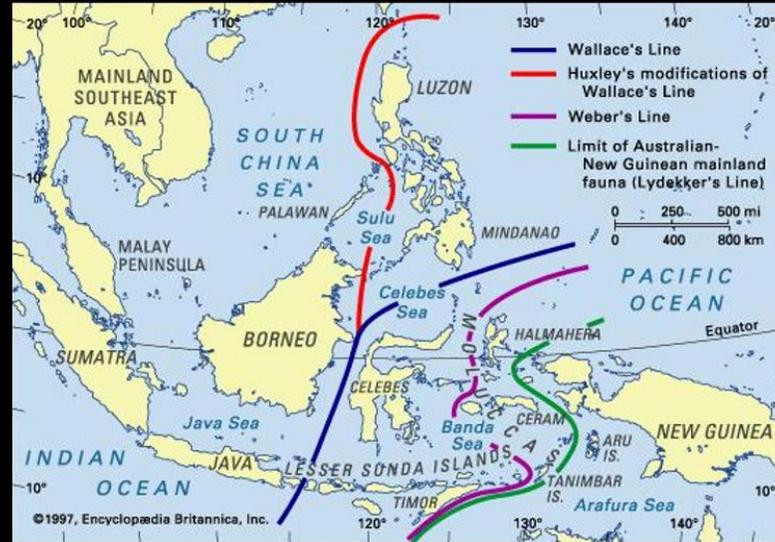
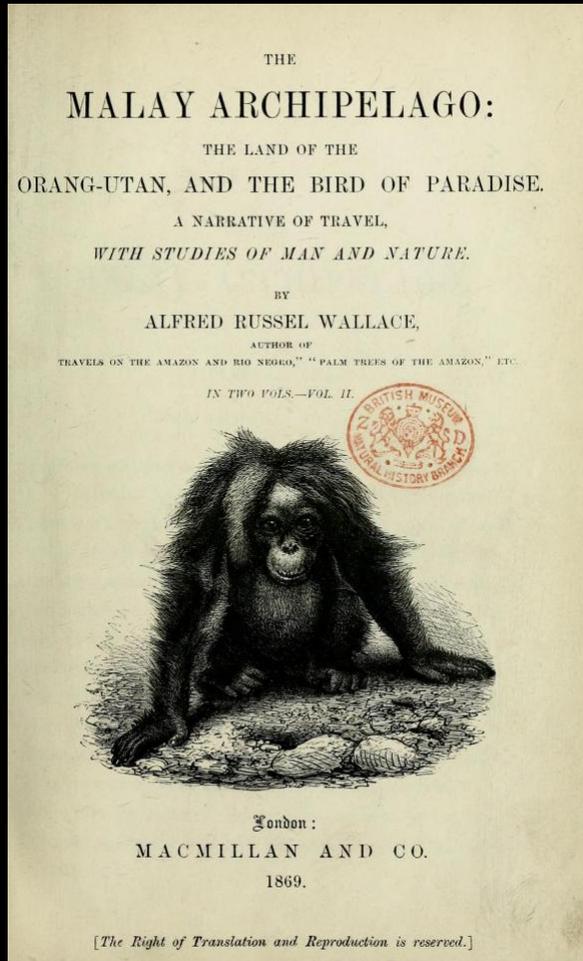
The book is thus rich and sophisticated, synthetic and revisionist. Richards benefits from previous scholarship on Darwin, but has herself delved deep into the notebooks, the printed record, and a wide range of secondary literatures to offer a wealth of discoveries and reinterpretations. Time and again, she guides readers through a passage we may think we know—and demonstrates the transformative power of new evidence and a different approach. Many of the canonical episodes in Darwin studies will never look quite the same again.



Alfred Russel Wallace (1823-1913)

Who was Alfred Russel Wallace?

Alfred Russel Wallace independently proposed a theory of evolution based on natural selection that prompted Charles Darwin to publish his own theory of evolution.



Alfred Russel Wallace (1823-1913)

- Advocate of natural selection
- Spiritualist
 - Phrenology
 - Mesmerism
 - Séances
- Defender of women's rights
- Socialist
- Middle class (unlike the more aristocratic Darwin)





1840-1843
Worked as
Land surveyor and
Maker of maps
Love for Science & Natural History was kindled.



1848-1852
Voyage to Amazon with Henry Bates
to collect insect and bird
specimens
His ship sank on the way and he lost specimens & journals



1854-1862
Voyage to Malay Archipelago which
defined Wallace's reputation as a
scientist, a naturalist and an explorer
Collected more than 125000 specimens



1862-1905
Published many books,
"The Malay Archipelago" has never gone out of print
since its first publication



1823
Born to
Thomas Wallace &
Mary Anne Greenall
near Welsh border



1843-1848
Became an amateur botanist and
spent hours at Leicester library
reading works of his
contemporaries

1853
Wrote two books
Palmbrees of the Amazon and there uses &
A narrative of travels on the Amazon and Rionegro

1858
Wrote an essay on his theory of
evolution "On the tendency of
varieties to depart indefinitely
from the original type"
Darwin presented Wallace's theory alongwith his as a
joint paper to Royal Society

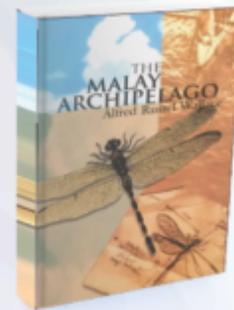
1913
In 1905 published his
autobiography,
"My Life"
Wallace passed away at the age of 90



Voyage to Amazon



Voyage to
Malay Archipelago



Alfred Russel Wallace

Life journey of an unsung hero of evolution

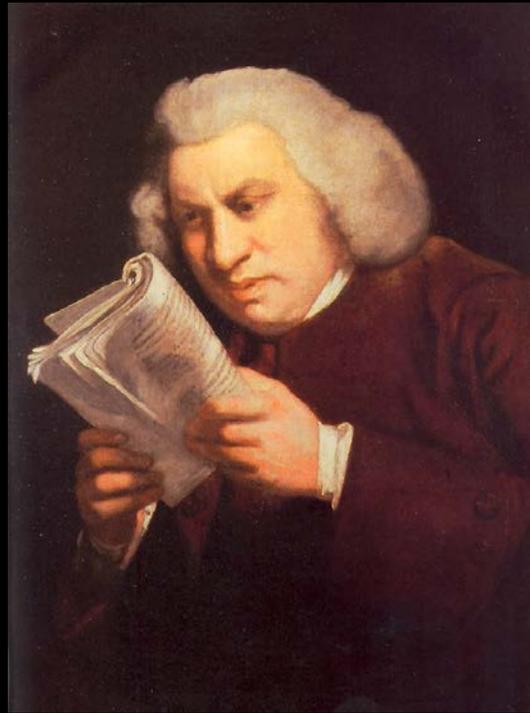
Designed by: Disha Chauhan and Saurabh Gayali
The Visual Stories Studio



What, for Richards, is the role of the sense of vision within sexual selection? (xxiv-xxv)

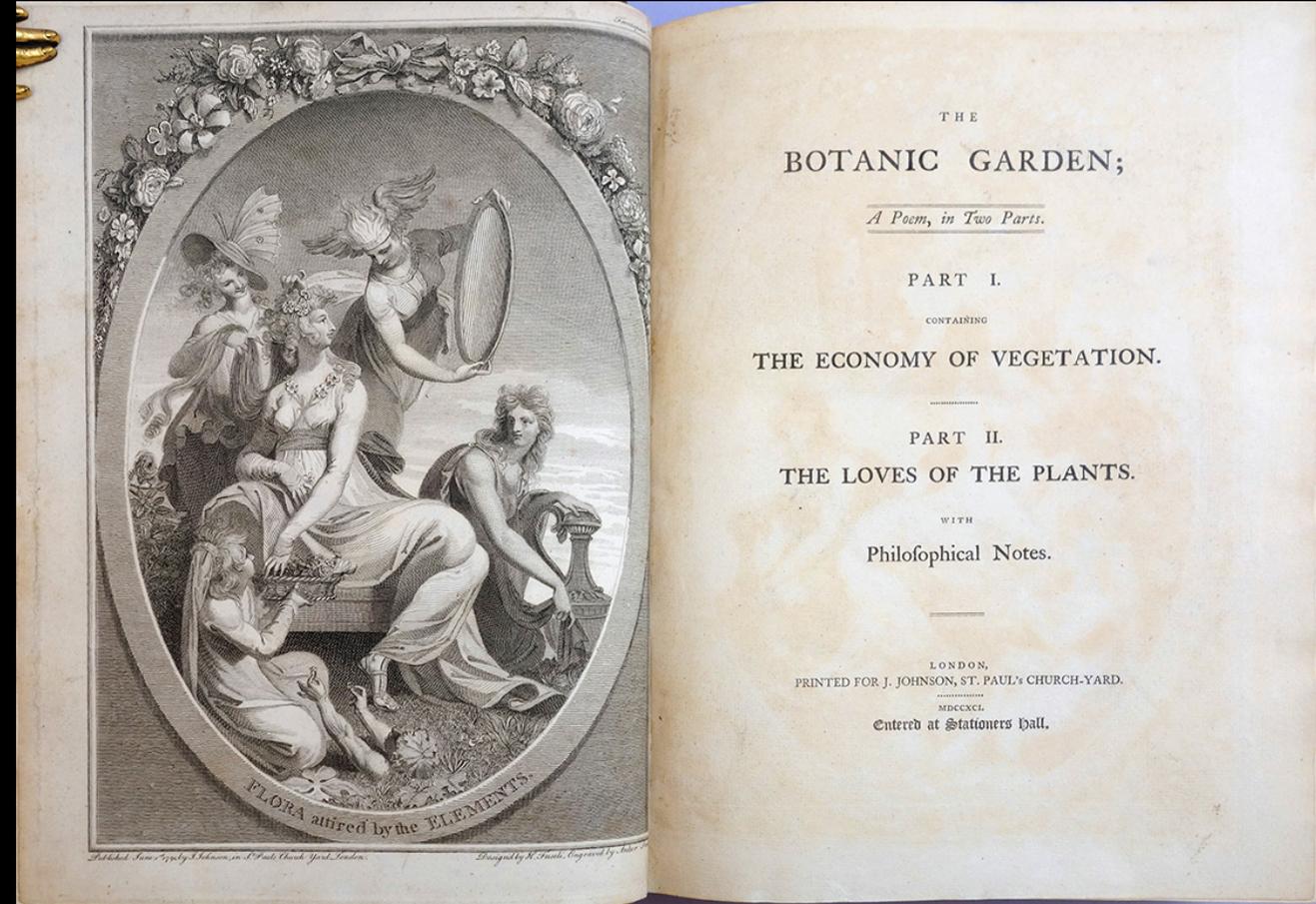
How does Richards think about sex and sexuality –
vis-à-vis Darwin's sexual selection? (xxvi-xxvii)

What are some of the influences on Darwin's
concept of 'beauty'? (95-98)



Erasmus Darwin (1731-1802)

- *The Botanic Garden* (1791) consists of two poems, *The Economy of Vegetation* and *The Loves of the Plants*
- Sexualized plants in order to popularize science
- Reframes/rewrites Linnaeus' classification scheme
- <http://www.en.utexas.edu/Classes/Moore/romantic/poetry/Darwin-46.pdf>





Left: Sir Joshua Reynolds, Self-Portrait, c. 1747-49

Right: Sir Joshua Reynolds, Mrs. Abington as Miss Prue in 'Love for Love' by William Congreve, 1771





According to Evelleen Richards, Darwin read the *Discourses on Art* (1778) of Sir Joshua Reynolds [1723-1792], the leading British academic painter of the eighteenth century and founder and first president of the Royal Academy of Arts. Darwin paid focused attention to the seventh discourse in Reynolds' book, where the aesthetic philosopher and portraitist veered from the universal truths that are essential to academic art, developing a relativistic and culturally informed type of beauty connected to the "apparent truths" of culture and science as opposed to "real truths" of morality and God. "As these secondary truths often had a long history," Richards writes, "and were widely disseminated, they approached 'nearer to certainty, and to a sort of resemblance to real science,' [Reynolds' words] and therefore must not be trivialized." Darwin embraced the "apparent truths" of Reynolds' eighteenth-century holistic vision of science and culture – just in the years as such holism would be ripped asunder by the rising sway of Comtean positivism.





- Reynolds's *Discourses* based on Humean empiricist dictum that beauty is 'no quality in things themselves.'
- It exists 'merely in the mind which contemplates them; and each mind perceives a different beauty.'
- Standard of taste was not intuitive but was experientially based and might be rationally disputed
- Timeless exemplars, or "authentic models" were "proportioned" and "accommodated" to something constant and enduring in human nature.
- Universal exemplars that were empirical proof of a single, universal, true standard of taste. (99-100)



Race and Aesthetics (102+)

Edmund Burke

1729 - 1797



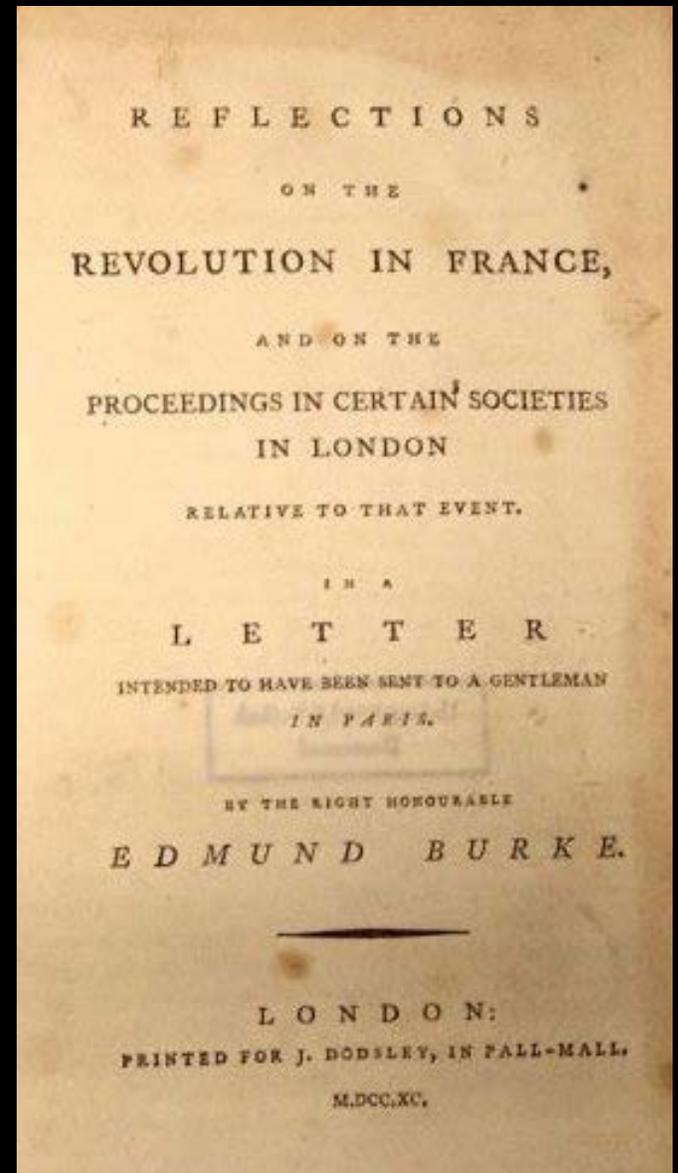
- British statesman, speaker, political theorist, and writer.
- His speeches and principles address the importance of morality implicit in the practical concerns of politics.
- His work, *Philosophical Inquiry into the Origin of Our Ideas of the Sublime and Beautiful* (1757), launched him as a leading literary figure.
- Famous speeches include: *Speech to the Electors of Bristol* and *Speech on Presenting to the House of Commons the 11th of February a Plan*.

Image Source: Credo Reference Database

Edmund Burke's *Philosophical Enquiry* re Sublime and Beautiful (1757)

- “**Sublime**”

- Anything that excites emotions of terror, pain, danger, astonishment
 - “productive of the strongest emotion the mind is capable of feeling” (37) (Pain more powerful than pleasure)
 - Fills the mind entirely, and “hurries us on by an irresistible force” (39)
- Emotions related to fear of death
- Associated with obscurity/mystery, as well as power, huge dimensions, infinity
- At **safe distance**, can produce delight
 - Stripped of means of power, can produce contempt!



Edmund Burke and Race p. 103

“Beauty is instinctive feeling & thus cuts the Knot...”
Darwin (106)

”taste, or the judgement of beauty, like birdsong, was
instinctive through inherited habit...” Darwin (107)



FUEGIA BASKET 1833.



JENNY'S WIFE 1834.



JENNY IN 1834.



JENNY BUTTON IN 1835.



YORK MINSTER IN 1835.



YORK IN 1835.

FUEGIANS.

Published by Henry Colburn, Great Marlborough Street, 1838.

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No. 337

THE DESCENT OF MAN,

AND SELECTION IN RELATION TO SEX.

BY CHARLES DARWIN, M. A., FELLOW OF THE ROYAL SOCIETY, ETC.

With Illustrations.

NEW EDITION, REVISED AND AUGMENTED.

COMPLETE IN ONE VOLUME.

NEW YORK: D. APPLETON AND COMPANY, 1880.

BY THE SAME AUTHOR.

- Origin of Species by Means of Natural Selection; or, The Preservation of Favored Races in the Struggle for Life. From sixth and last London edition. 2 vols. 12mo. Cloth, \$4.00.
- Descent of Man, and Selection in Relation to Sex. With many Illustrations. A new edition. 12mo. Cloth, \$3.00.
- Journal of Researches into the Natural History and Geology of the Countries visited during the Voyage of H. M. S. Beagle round the World. A new edition. 12mo. Cloth, \$2.00.
- Emotional Expressions of Man and the Lower Animals. 12mo. Cloth, \$3.50.
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- The Effects of Cross and Self Fertilization in the Vegetable Kingdom. 12mo. Cloth, \$3.00.
- Different Forms of Flowers on Plants of the same Species. With Illustrations. 12mo. Cloth, \$1.50.
- The Power of Movement in Plants. By CHARLES DARWIN, LL.D., F.R.S., assisted by FRANCIS DARWIN. With Illustrations. 72mo. Cloth, \$2.00.
- The Formation of Vegetable Mould, through the Action of Worms. With Observations on their Habits. With Illustrations. 12mo. Cloth, \$1.50.

NEW YORK: D. APPLETON & CO., PUBLISHERS.

Left: Illustrations of Fuegians -- Jimmy Button and other Yamana captives taken by Fitzroy to England -- from the Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle, between the years 1826 and 1836, describing their examination of the Southern shores of South America, and the Beagle's circumnavigation of the globe. Wellcomecollection.org

While observing the barbarous inhabitants of Tierra del Fuego, it struck me that the possession of some property, a fixed abode, and the union of many families under a chief, were the indispensable requisites of civilization. (Darwin, *Descent*, 872)

The Fuegians rank amongst the lowest barbarians; but I was continually struck with surprise how closely the three natives on board HMS Beagle, who had lived some years in England and could talk a little English, resembled us in disposition and in most of our mental faculties. If no organic being excepting man had possessed any mental power, or if his powers had been of a wholly different nature from those of the lower animals, then we should never have been able to convince ourselves that our high faculties had been gradually developed. But it can be clearly shewn that there is no fundamental difference of this kind. We must also admit that there is no fundamental difference of this kind. We must also admit that there is as much wider interval in mental power between one of the lowest fishes, as a lamprey or lancelet, and one of the higher apes, than between an ape and man; yet this immense interval is filled up by a numberless gradations. (Darwin, *Descent*, 798)



FUCOTA BASKET 1833.



JENNY'S WIFE 1834.



JENNY IN 1834.



JENNY BUTTON IN 1833.



YORK NINSTER IN 1833.



YORK IN 1833.

FUEGIANS.



Top Left: Titian, Venus and Musician or Venus with an Organist and a Dog, c. 1550

Top Right: Titian, Venus and the Lute Player, c. 1565-70

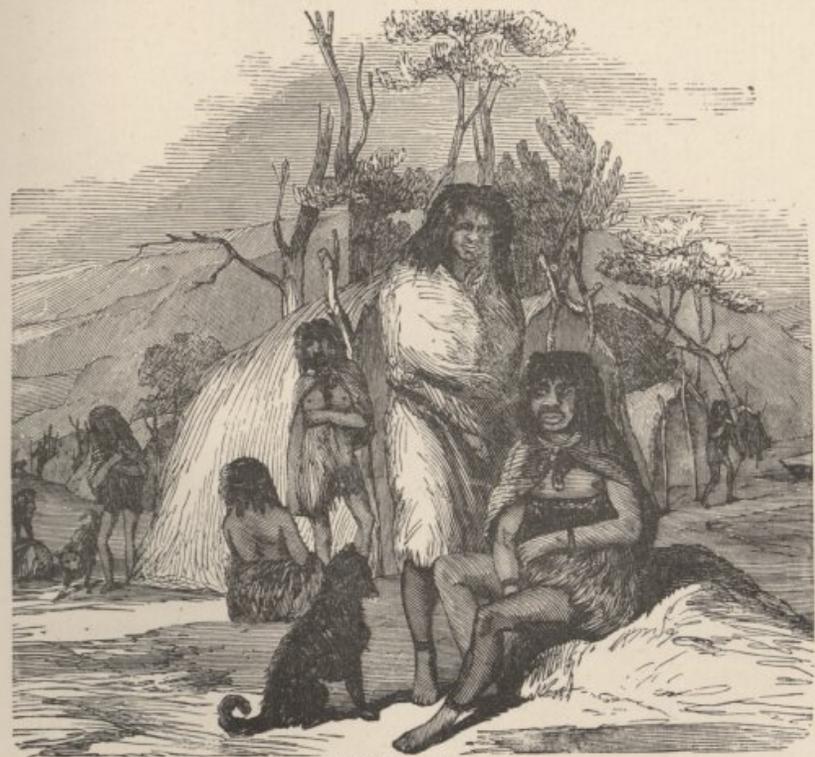
Bottom Left: Titian, Venus with a Mirror, cc. 1555

“She adheres closely to the canon of female beauty extolled by Renaissance poets: blond hair, fair skin flushed with pink, red lips and arched brows.” <https://www.nga.gov/collection/highlights/titian-venus-with-a-mirror.html>



HEAD OF FUEGIAN.

HEAD OF A TAHITIAN.



FUEGIAN VILLAGE.



FUEGIAN.

(YAPOO TEKENICA)

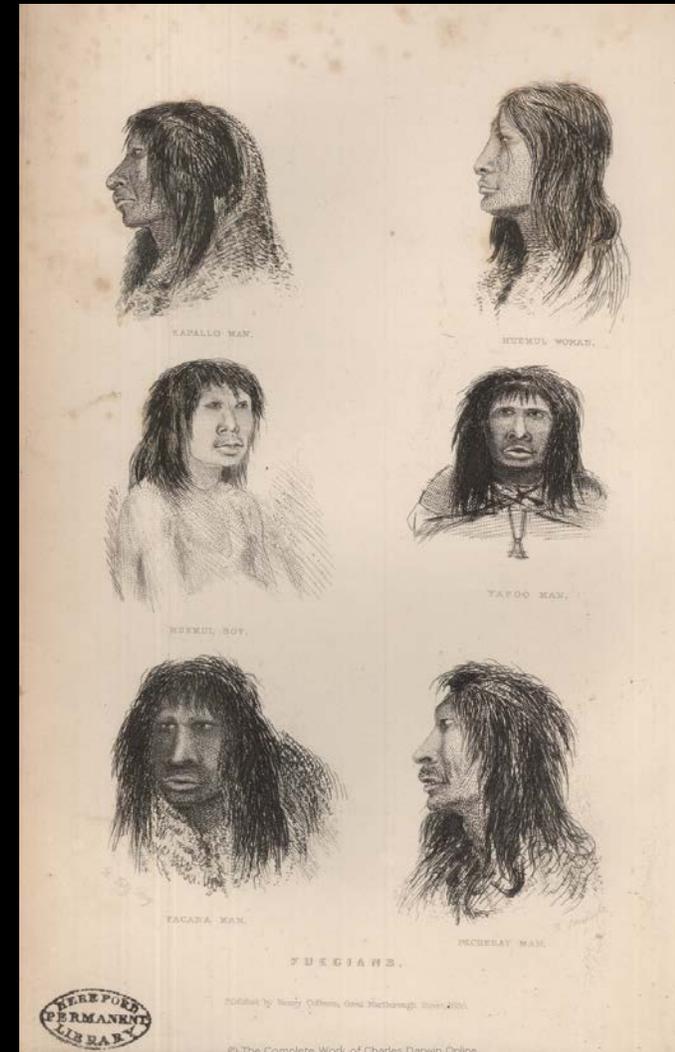
AT PORCELAIN EDGE





FUGIANS AND THEIR WIGWAMS.

We are back with the ugly Fuegian, who knows no god and is the antithesis of the Titian *Venus*, the goddess of love and beauty. If gods represent a people's ideal of beauty, and if belief in a god or gods is dependent on moral and intellectual progress, then, in Darwin's aesthetics, beauty of body and morality are interlinked. It is the evolving, habituated notion of the beautiful that, through sexual selection, accounts for the differentiation of people into races or cultures with distinct physical differences and moral codes.¹¹⁰ In this sense, the traditional aesthetic equation of beauty with goodness and ugliness with depravity or evil persists in Darwin's aesthetic hierarchy that ascends from the godless, immoral Fuegians—whose taste for valueless glitter and gaudy rags is comparable to that of animals and less than that of birds—to the higher levels of artistic representation of the beautiful in Greek mythology and statuary, with the further implication that the highest, so-far-attained association of the beautiful and the good is to be found in the aesthetic judgment of the cultured, civilized European.



Above Right: Fuegians
Left: Titian, Venus of Urbino, 1534

The sense of vision...(119)

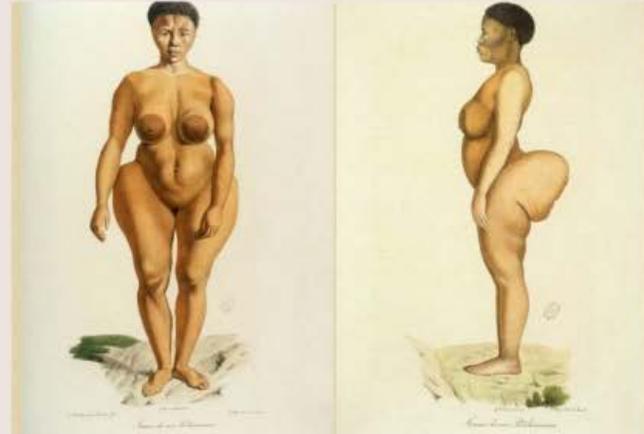
Victorian ocularcentrism and anthropocentrism...

Beauty, Race, Measurements

"The Hottentot Venus": Bartman on Display in Europe

-During tours of Europe, Bartman was exhibited as a semi-naked carnival attraction standing in a bamboo cage, sometimes accompanied by an elephant. Along with being ordered to walk, stand, or sit for audience amusement, audiences could pay to poke or touch Bartman's body.

In 1815, Bartman was studied by naturalist George Cuvier who claimed that she was a link between animals and humans. French anatomists, zoologists, and physiologists also studied Bartman and claimed that her body parts were proof that Africans were a parahuman race whose sexuality was exaggerated and whose intelligency was less than their white counterparts.



Beauty, Females, and Women



Victorian cartoonists quickly picked up on Darwin's ideas about display in sexual selection. Here to the left he is fascinated by the apparent steatopygia in the latest fashion (Wiki) This connects to the earlier story of Sarah Baartman (1789 – 1815), aka the Hottentot Venus. Two centuries ago Baartman died after years spent in European "freak shows".

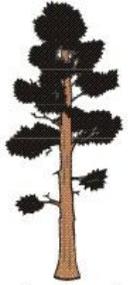
Typology Revisited



Carolus Linnaeus 1707-1778

- Linnaeus was the first person to propose an orderly system for classifying organisms.
- He developed the Binomial System of Naming Plants in 1753
 - Bi= 2
 - Nomial= name
 - All plants have a scientific name composed of two Latin names known as a **genus** and **specie**
- His system is still used today and his called the Father of Taxonomy!

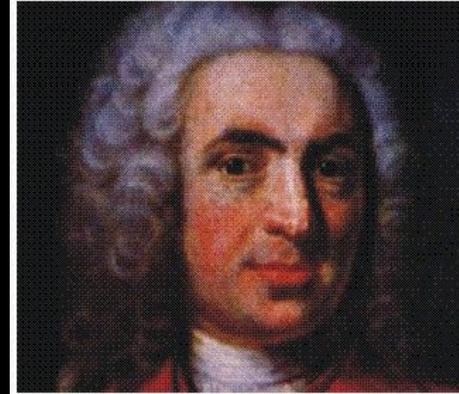


 World's Greatest 1000  Creation Scientists 2000 

Canis familiaris

CAROLUS LINNAEUS

1707 - 1778 *Sequoia gigantea*



POLYGALA floribus imberbibus, pedunculis squar-
 rosis, caule herbaceo ramoso erecto.
 Habitat in Virginia Kalm. ☉
 Caulis spinosus s. pedalis, firmus, angulatus, rami-
 fus, erectus, ramis caule altioribus. Folia alterna, an-
 gulo-lanceolata. Spica terminalis, laxa, sanguinea, o-
 vata, decidua enim flosculi inferiores maturi, dum
 novelli accrescunt unde, Pedunculis lateris s. Squar-
 rajas.

- Taxonomy • Botany • Medicine**
- “Father of Taxonomy” – developed binomial name system still in use today
 - Originator of modern classification system for plants and animals
 - Author of 180 works, including classifications of plants and diseases

“He was a man of great piety and respect for the Scriptures. One of his main goals in systematizing the tremendous varieties of living creatures was to attempt to delineate the original Genesis ‘kinds’.”

– Dr. Henry M. Morris

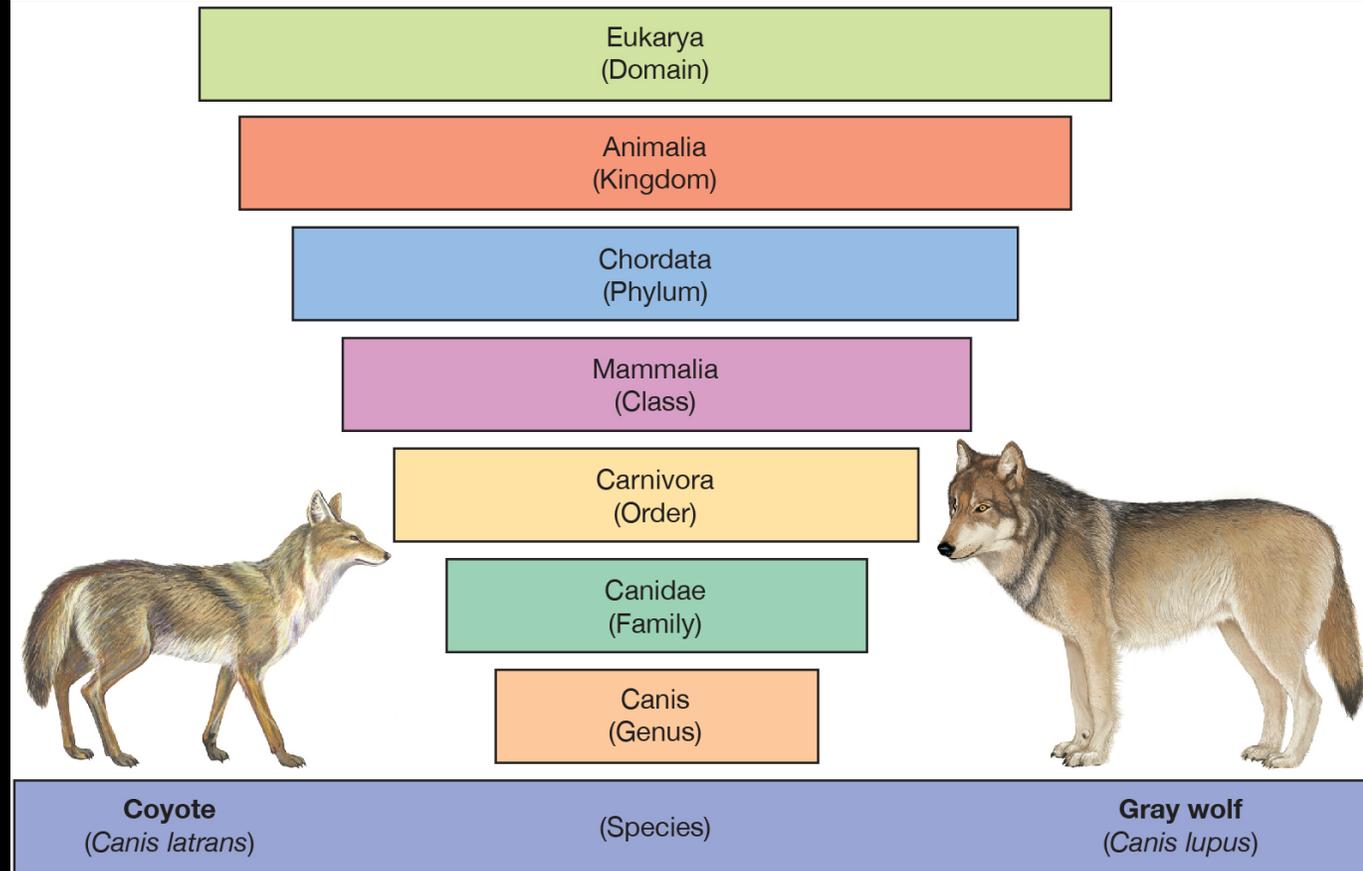
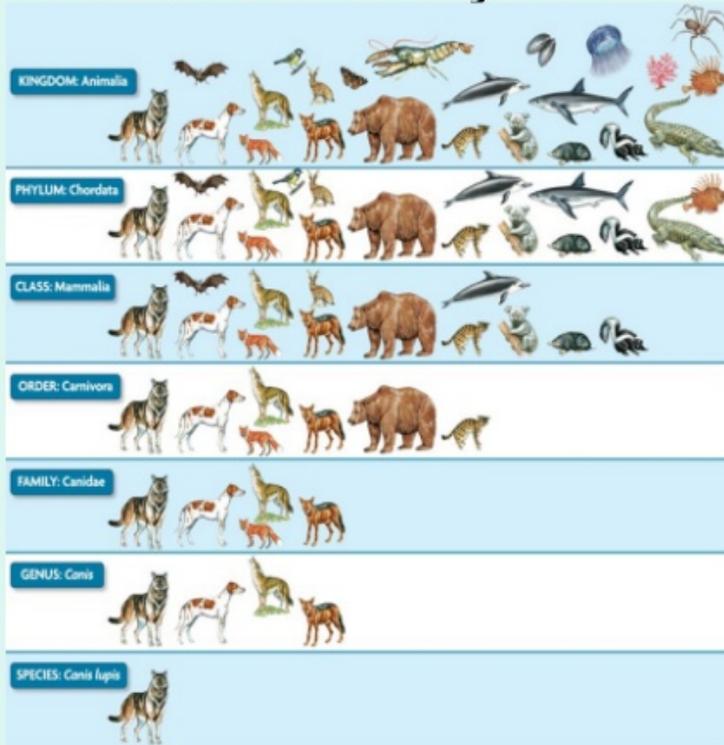


“The flowers’ leaves . . . serve as bridal beds which the Creator has so gloriously arranged, adorned with such noble bed curtains, and perfumed with so many soft scents that the bridegroom with his bride might there celebrate their nuptials with so much the greater solemnity. . . .”

– Carolus Linnaeus

Linnaeus' classification system

- Each level is included in the level above it.
- Levels get increasingly specific from kingdom to species.



The bad science of types and typology...

and the resonances in art, architecture, and aesthetics...

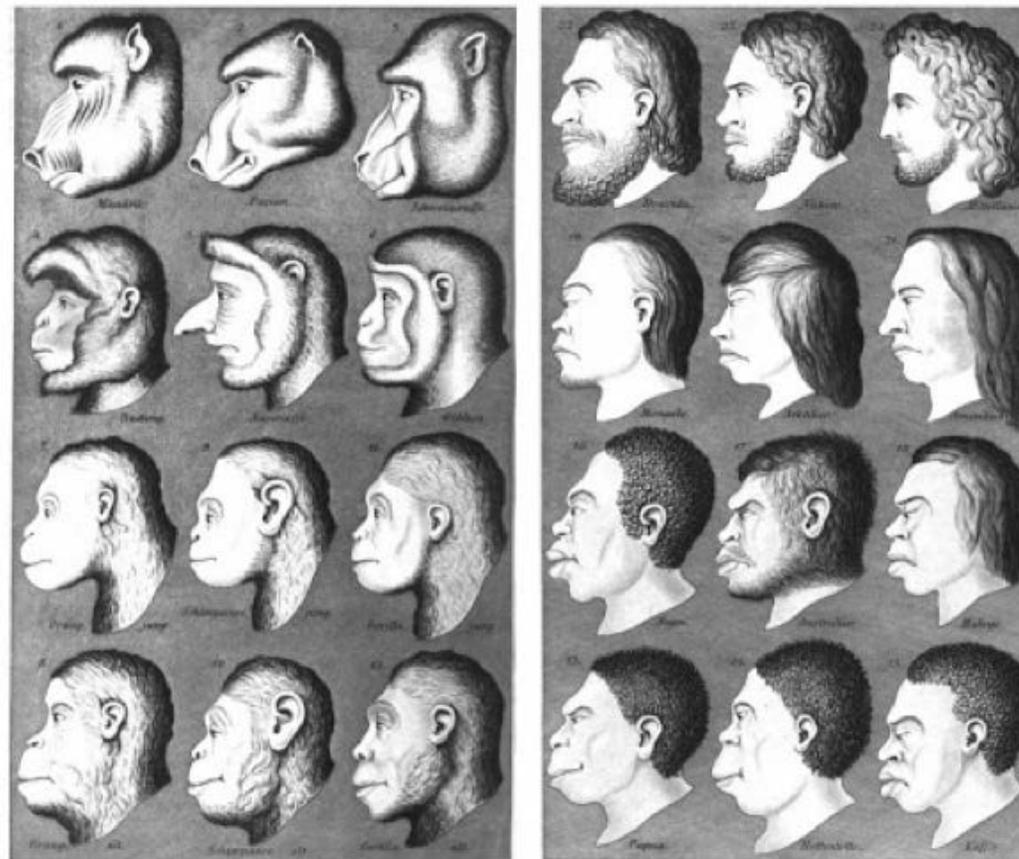
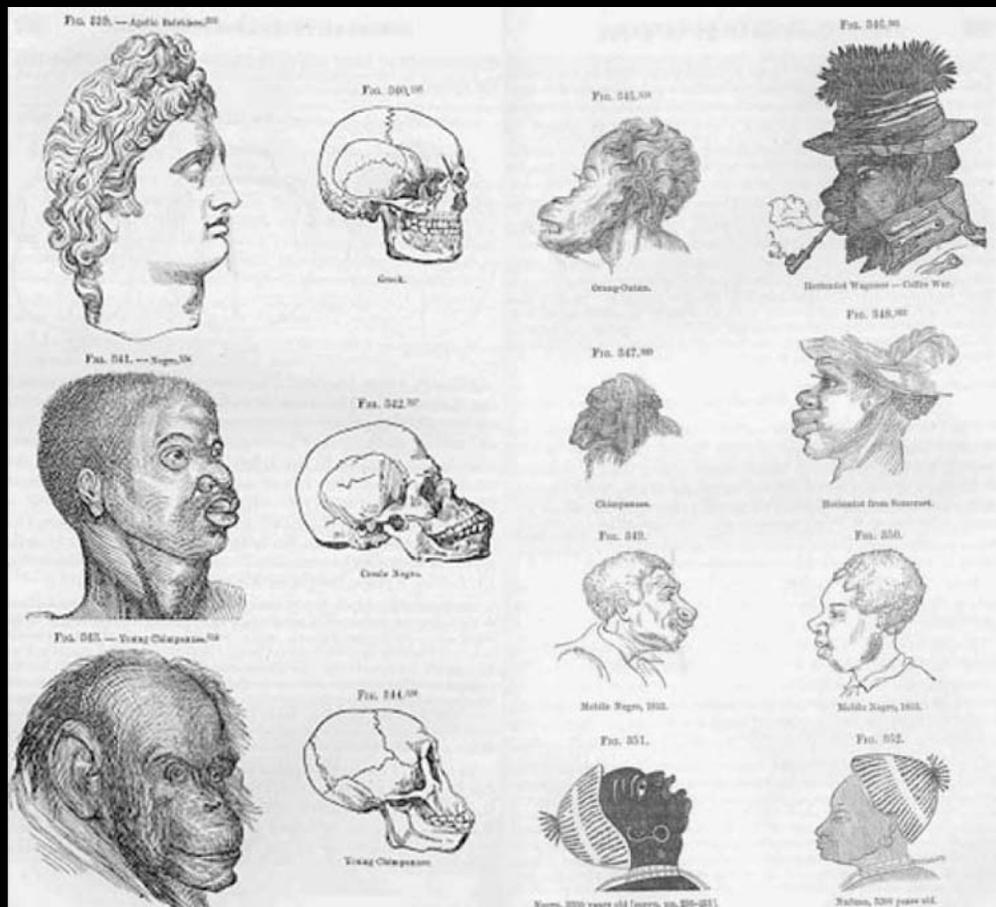


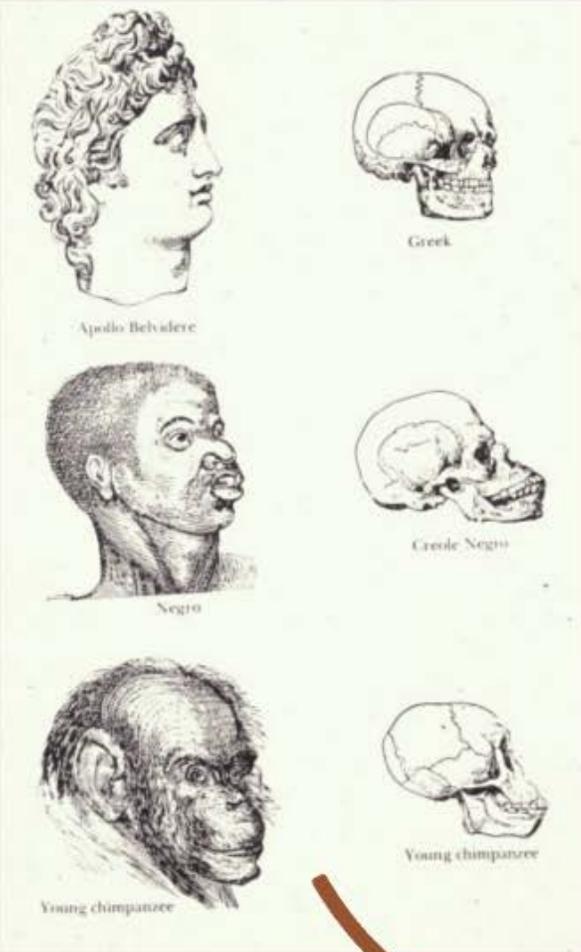
Fig. 2. Plates 13 and 14, from the second German edition of Ernst Haeckel's *Natürliche Schöpfungsgeschichte* (1870). Haeckel modified it from an even more offensive illustration in the first German edition of 1868, but neither figure appeared in the English translation (Public Domain).

Left: Excerpt from “Crania Americana” by Samuel George Morton showing supposed differences between the skulls of different races. Imagery taken from *Indigenous Races of the Earth* (1857), whose authors Nott and George Glidden implied that "Negroes" were a creational rank between "Greeks" and chimpanzees.

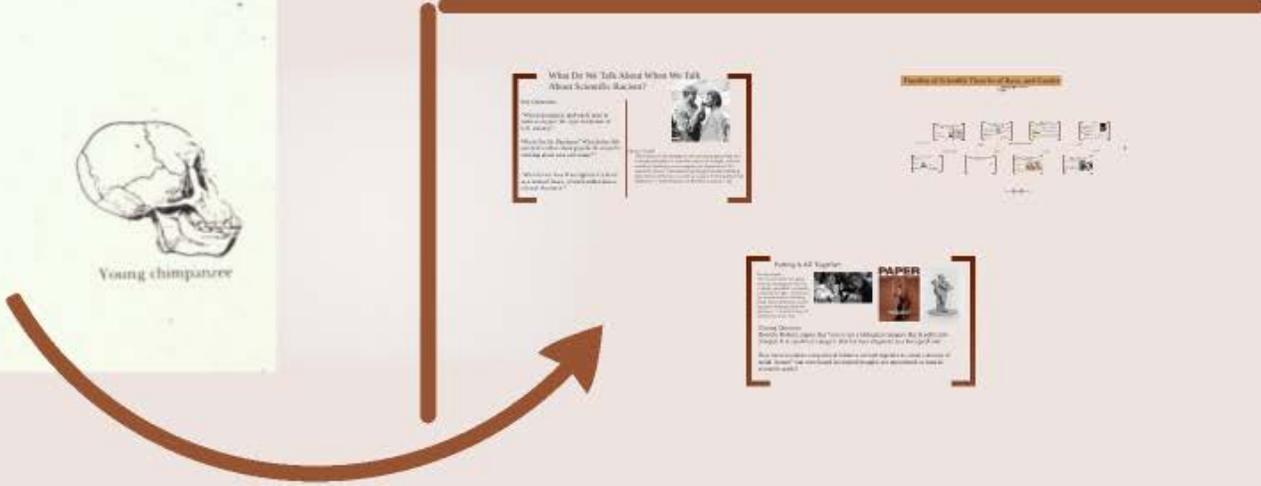
<https://pages.vassar.edu/realarchaeology/2017/03/05/phrenology-and-scientific-racism-in-the-19th-century/>

Right: Ernst Haeckel (1870)

Specters of the Human: Scientific Theories of Race, Sex, and Civilization from Typology through Eugenics



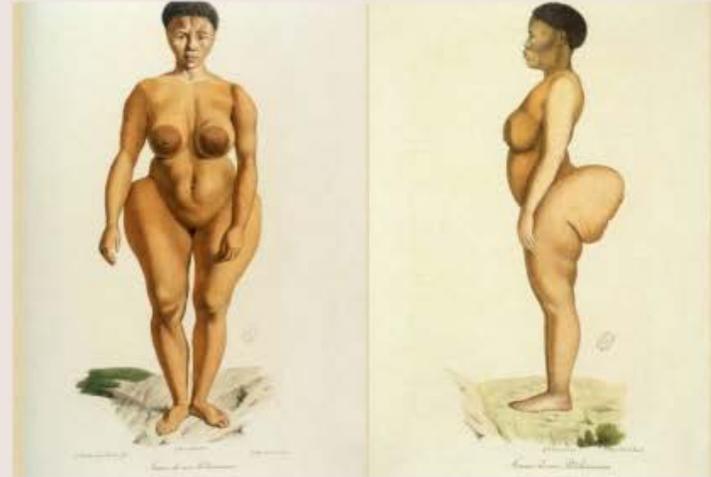
Dorothy Roberts:
"Race is not a biological category that is politically charged. It is a political category that has been disguised as a biological one" (Fatal Invention: How Science, Politics, and Big Business Re-create Race in the Twenty-first Century, 4, 2012)



"The Hottentot Venus": Bartman on Display in Europe

-During tours of Europe, Bartman was exhibited as a semi-naked carnival attraction standing in a bamboo cage, sometimes accompanied by an elephant. Along with being ordered to walk, stand, or sit for audience amusement, audiences could pay to poke or touch Bartman's body.

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Recapitulation Theory

Phylogeny recapitulates ontogeny

Drawings of Vertebrate Embryos (1874) by Ernst Haeckel [1834-1919]

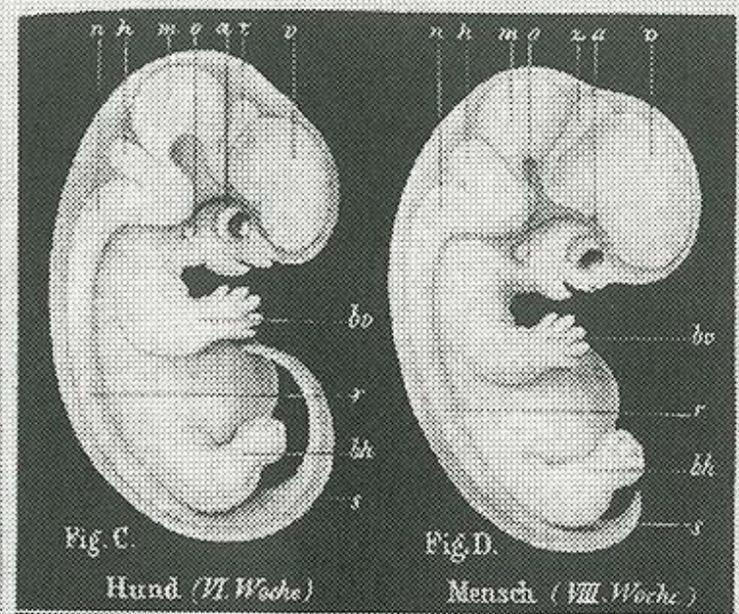
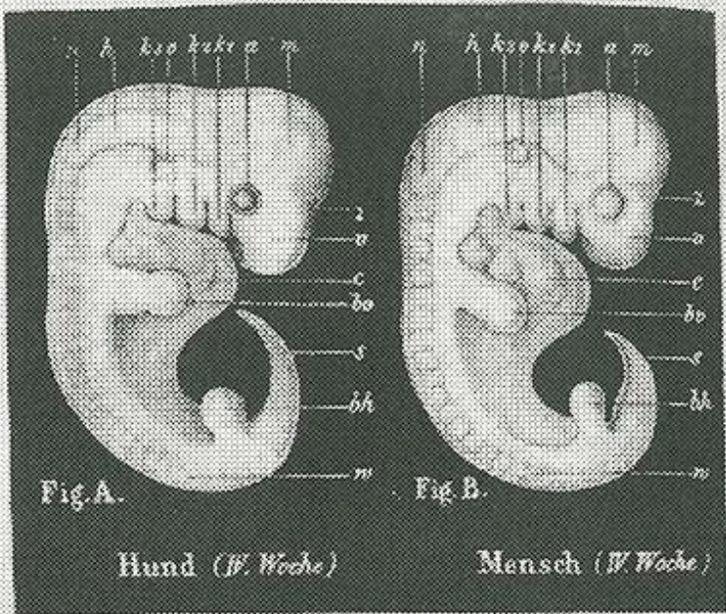
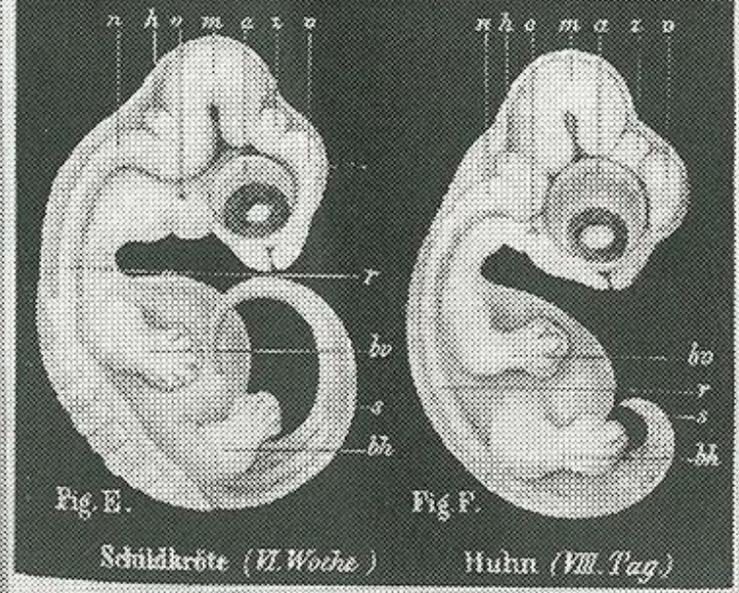
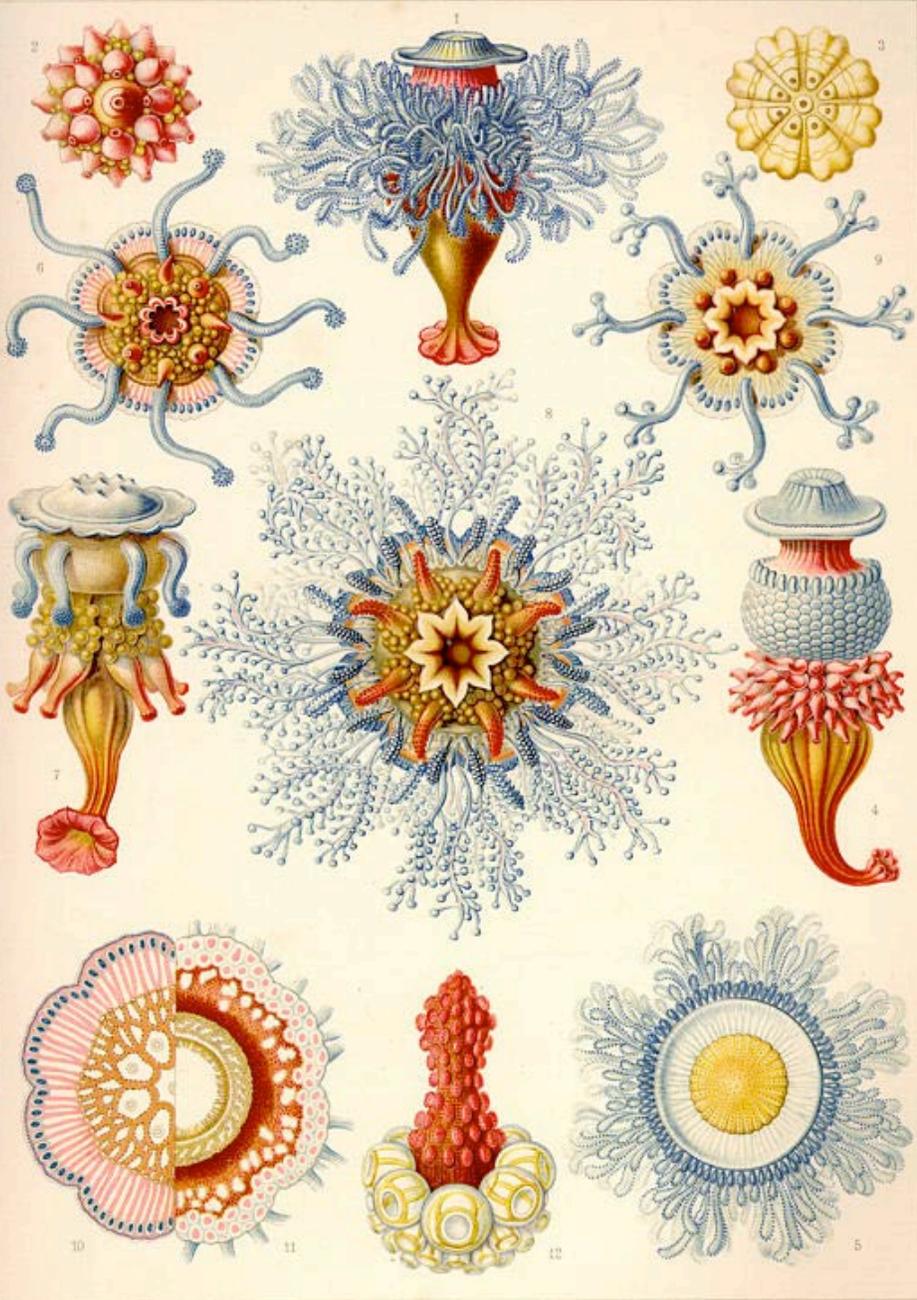


Fig. A. Keim des Hundes, 5" lang (aus der vierten Woche). Fig. B. Keim des Menschen, 5" lang (aus der vierten Woche). Fig. C. Keim des Hundes, 8½" lang (aus der sechsten Woche). Fig. D. Keim des Menschen, 8½" lang (aus der achten Woche). Fig. E. Keim der Schildkröte, 7" lang (aus der sechsten Woche). Fig. F. Keim des Huhns, 7" lang (acht Tage alt). Fig. A und B sind 5mal, Fig. C—F 4mal vergrössert. Die Buchstaben haben in allen sechs Figuren dieselbe Bedeutung: r Vorderhirn, z Zwischenhirn, m Mittelhirn, k Hinterhirn, a Nachhirn, v Rückenmark, a Auge, e Ohr, k1, k2, k3 erster, zweiter und dritter Kiemenbogen, a Wirbel, c Herz, bo Vorderbein, bh Hinterbein, s Schwanz.



Dog and human embryos, looking almost identical at 4 weeks then differing at 6 weeks. Lower right corner shows a 6-week turtle embryo and 8-day hen embryo. Ernst Haeckel (1868)



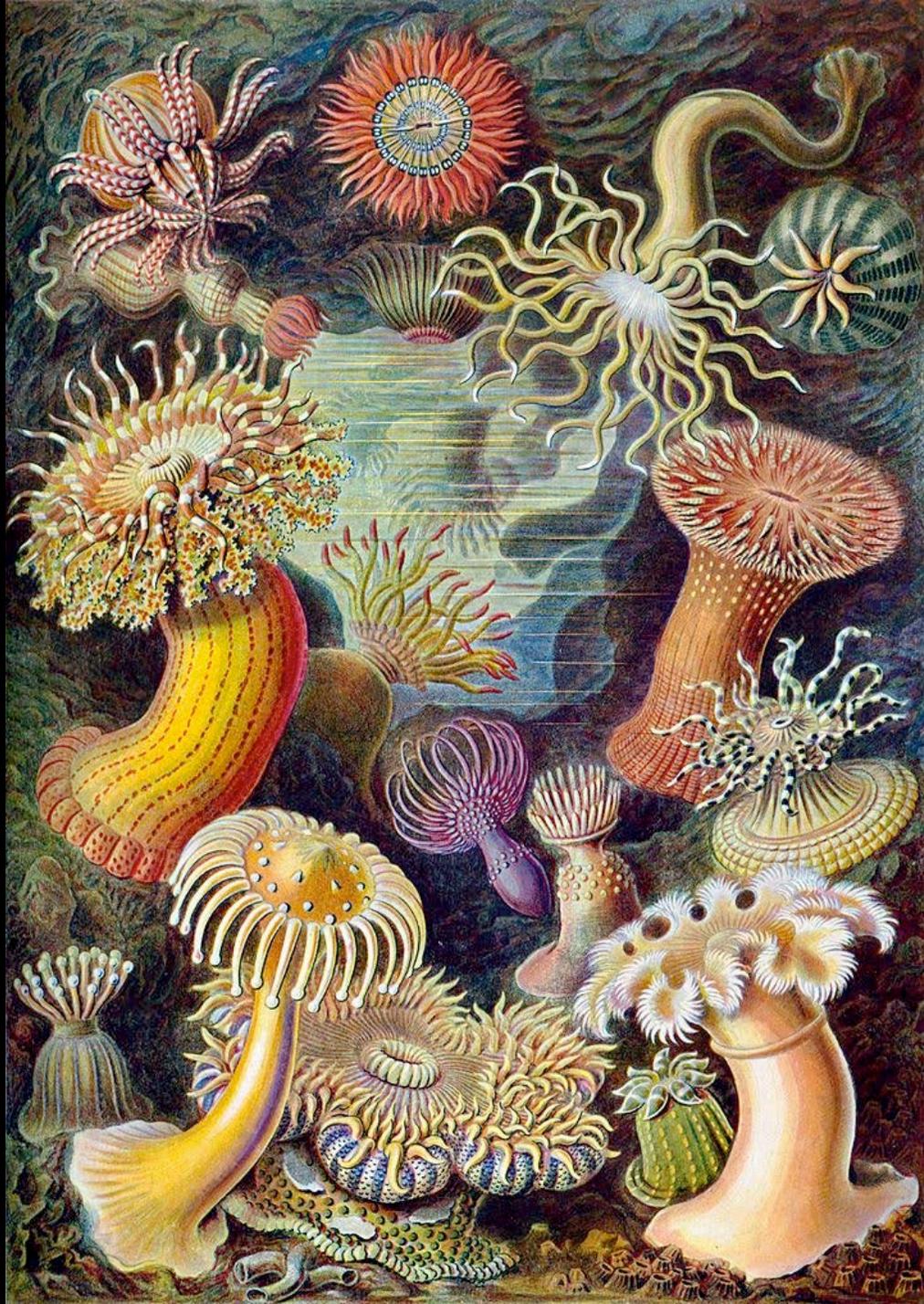
Siphonophorae. — Staatsquallen.

ecology

From the Greek “oikos” meaning house or environment and “logos” knowledge or study of

Coined by Haeckel in 1866, ecology means the scientific study of the interaction of organisms and their environment.

Ernst Haeckel's Radiolaria (1862)



Actiniae, plate 49 from Ernst Haeckel's *Kunstformen der Natur* (1904)



FUEGIA BASKET 1833.



JENNY'S WIFE 1834.



JENNY IN 1834.



JENNY BUTTON IN 1835.



YORK MINSTER IN 1835.



YORK IN 1835.

FUEGIANS.

Published by Henry Colburn, Great Marlborough Street, 1838.

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Emotional Expressions of Man and the Lower Animals. 12mo. Cloth, \$3.50.

The Variations of Animals and Plants under Domestication. With a Preface, by Professor ASA GRAY. 2 vols. Illustrated. Cloth, \$5.00.

Insectivorous Plants. 14mo. Cloth, \$2.00.

Movements and Habits of Climbing Plants. With Illustrations. 12mo. Cloth, \$1.25.

The Various Contrivances by which Orchids are Fertilized by Insects. Revised edition, with Illustrations. 12mo. Cloth, \$1.75.

The Effects of Cross and Self Fertilization in the Vegetable Kingdom. 12mo. Cloth, \$3.00.

Different Forms of Flowers on Plants of the same Species. With Illustrations. 12mo. Cloth, \$1.50.

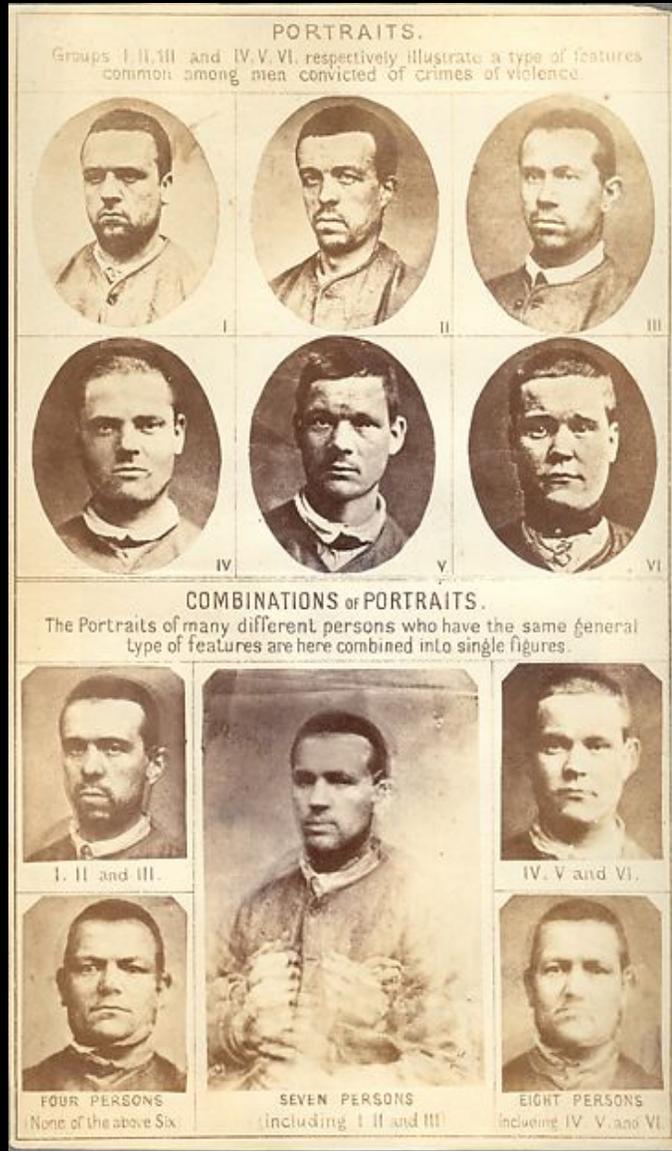
The Power of Movement in Plants. By CHARLES DARWIN, LL.D., F.R.S., assisted by FRANCIS DARWIN. With Illustrations. 72mo. Cloth, \$2.00.

The Formation of Vegetable Mould, through the Action of Worms. With Observations on their Habits. With Illustrations. 12mo. Cloth, \$1.50.

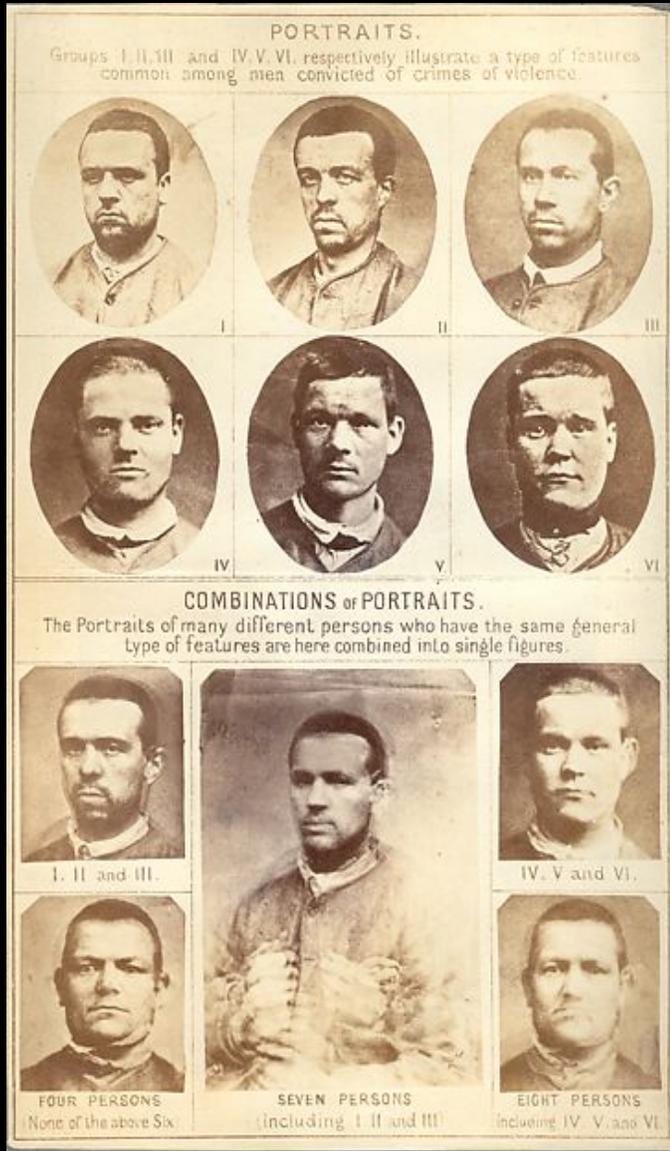
NEW YORK: D. APPLETON & CO., PUBLISHERS.

Left: Illustrations of Fuegians -- Jimmy Button and other Yamana captives taken by Fitzroy to England -- from the Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle, between the years 1826 and 1836, describing their examination of the Southern shores of South America, and the Beagle's circumnavigation of the globe. Wellcomecollection.org

Francis Galton and Composite Photography



Francis Galton and Composite Photography



Notorious for his ideas about improving the genetic composition of the human population—a field of study he called “eugenics”—Galton devised the technique of composite portraiture as a tool for visualizing different human “types.” He first applied the method to portraits of convicts to determine whether specific facial features could be associated with distinct types of criminality. He later went on to create composite photographs of other segments of the population whose members were considered feeble or socially inferior, including the mentally ill, tuberculosis patients, and Jews. Later, he turned to the “healthy and talented” classes—Anglican ministers, Westminster schoolboys, doctors, scientists, and Royal Engineers.

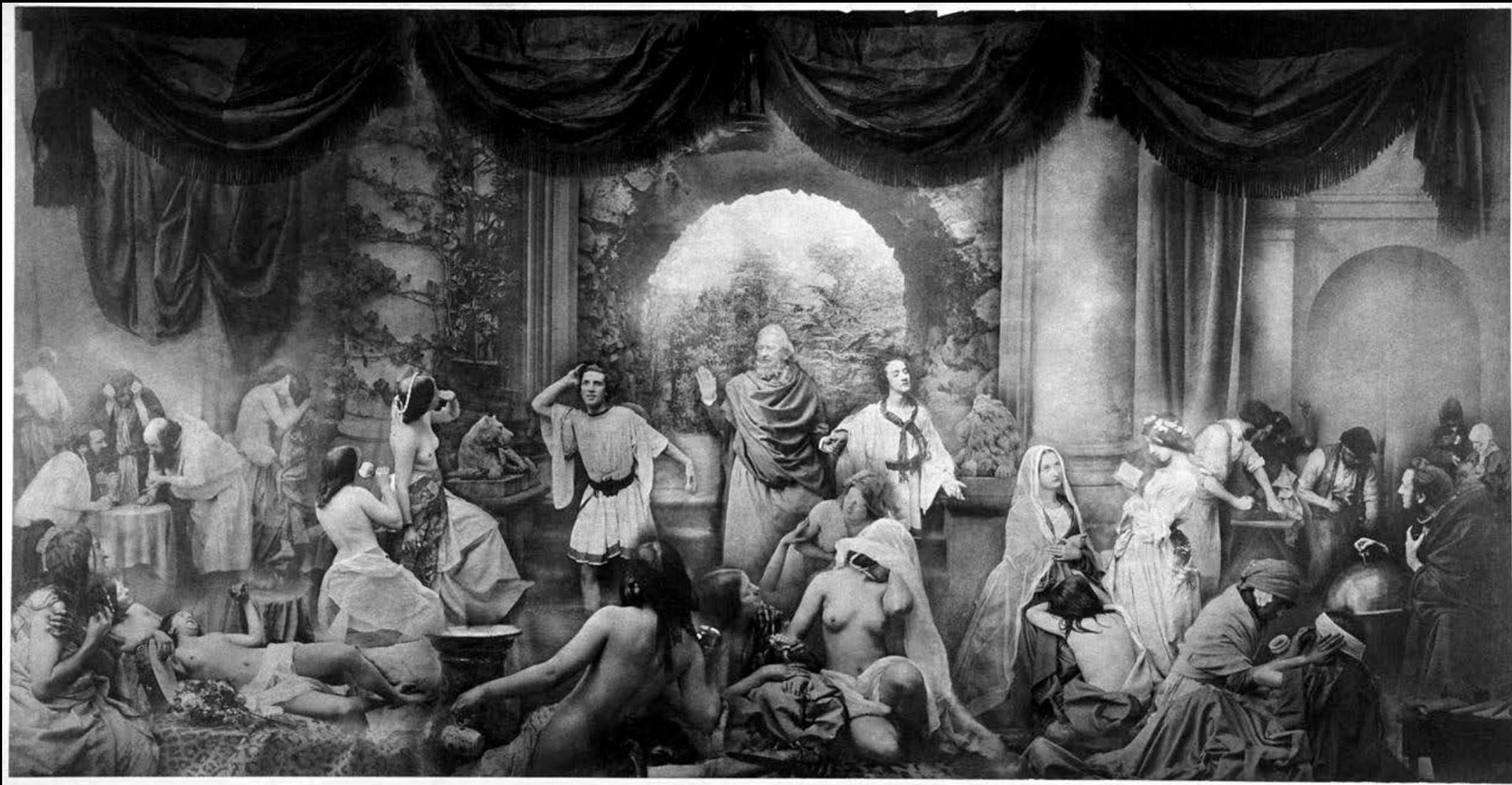
<https://www.metmuseum.org/art/collection/search/301897>

Francis Galton, Composite Portraits of Criminal Types, 1877

Victorian Composite Photography

Oscar Gustave Rejlander, *Two Ways of Life*, 1857

In 1857 he made his best-known allegorical work, *The Two Ways of Life*. This was a seamlessly montaged combination print made of thirty-two images in about six weeks. First exhibited at the Manchester Art Treasures Exhibition of 1857, the work shows two youths being offered guidance by a patriarch. Each youth looks toward a section of a stage-like tableaux vivant - one youth is shown the virtuous pleasures and the other the sinful pleasures.



Neo-Malthusianism

classical artistic medium



Thomas Couture, *The Romans of the Decadence*, 1847



Oscar Gustave Rejlander, *Two Ways of Life*, 1857

BORN 1822.

SCIENCE possesses a learned devotee in Mr. Francis Galton—a name made famous by research in the subjects of heredity, meteorology, anthropology, and by successful scientific travel. Mr. Galton was born in 1822, and after studying medicine, graduated at Trinity College, Cambridge. For an exhaustive account of a charge of the Royal Observatory at Kew. The present interest in finger-prints as a means of identification is almost wholly due to the writings of this indefatigable scientist.

AGE 22. From a Silhouette. AGE 66. From a Photograph. AGE 42. From a Photo. by [Moir & Ralph].

1897 Francis Galton British Eugenics poster by Paul D Stewart.

- In 1865, Darwin's half-cousin Sir Francis Galton published "Hereditary Talent and Character"
- one could apply the principle of artificial selection to humans just as one could in domestic animals, thereby exaggerating desirable human traits over several generations
- Galton coined the term "eugenics, in 1883, bringing together the Greek "eu" meaning "good" or "well" and "genics" meaning "born"
- In order to curtail the genetic pollution created by "inferior" genes, some governments made laws authorizing the forcible sterilization of the "insane, idiotic, imbecile, feebleminded or epileptic," as well as individuals with criminal or promiscuous inclinations
- hundreds of thousands of people were forced or coerced into sterilization worldwide, over 65,000 of them in the country which pioneered the eugenic effort: the USA

(Réduction photographique 1/7.)

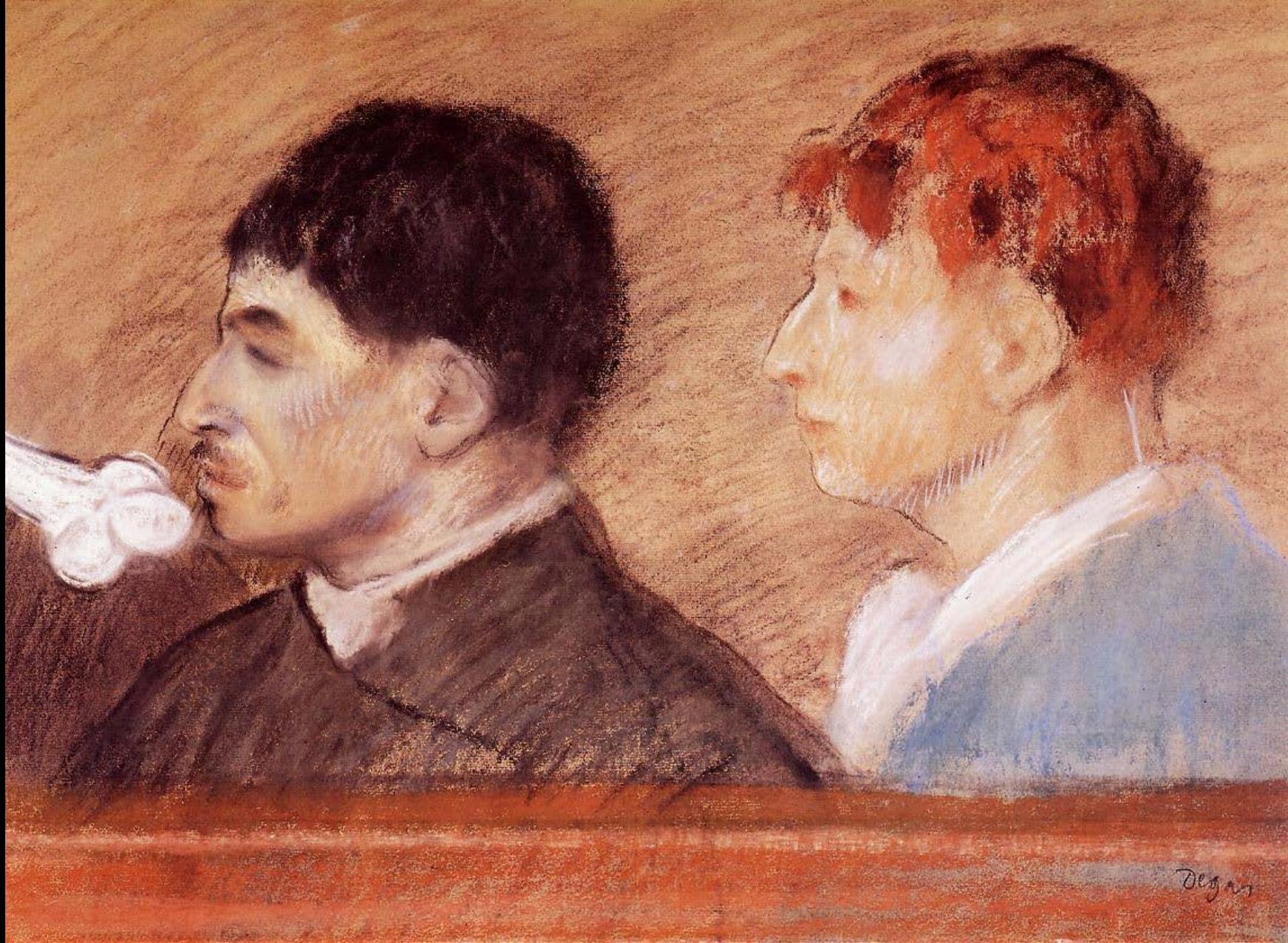
M^r. Galton 19.4.93

277

Front.	Inclin* Haut* Larg* Part**	Sax.	Racine (cavité)	Urcille droite.	Bord. o. s. p. f.	Barbe	Color* (pig**
			Bas		Lob. c. a. m. d.	Cheveux	'sang*
			Haut* Saillie. Larg*		A. trg. i. p. r. d.	Car	Cuint.
			Part**		Pli. f. s. h. E	Autres traits caractéristiques :	
			Part**	Part.		Sig ^t dressé par M.	

Francis Galton, aged 71, photographed as a criminal on his visit to Bertillon's Criminal Identification Laboratory in Paris, 1893.

An anthropometry photograph of Francis Galton at age 71, taken during a visit to Alphonse Bertillon's Criminal Identification Laboratory in Paris in 1893. Bertillon originated the criminal identification programme of face-on and profile photographs together with key biometric measurements. Galton, meanwhile, studied fingerprints and published two major works on the subject.



Edgar Degas, Criminal Physiognomies, 1881



Tronie painting

Typological Paintings

“face” or “head” painting

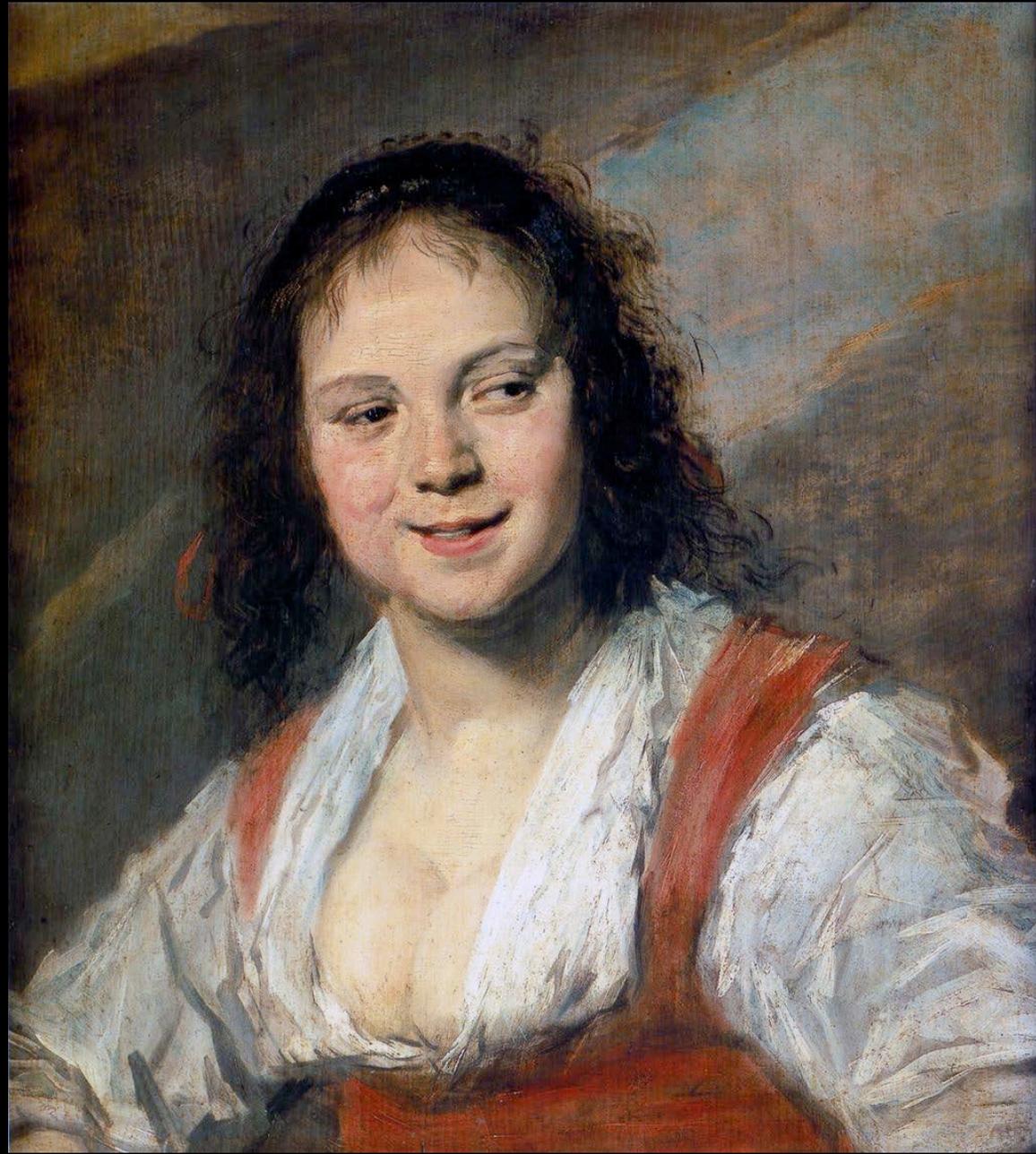
Johannes Vermeer, *The Girl with a Pearl Earring*, c. 1665



Leonardo da Vinci, Studies of grotesque heads, c.1494



Left: Joos van
Craesbeeck,
The Smoker,
1635



Right: Frans
Hals, The
Gypsy Girl,
1628



Left: Govert Flinck ,Portrait of African Male, c. 1645

Right: Govert Flinck, A Young Archer, 1639-40



Left: Frans Hals,
Malle Babbe,
1633-35



Right: Adriaen
Brouwer, Youth
Making a Face,
1632



August Sander, Washer Woman, 1930



August Sander, Beggar, 1926



August Sander, Criminal Type, 1926-30

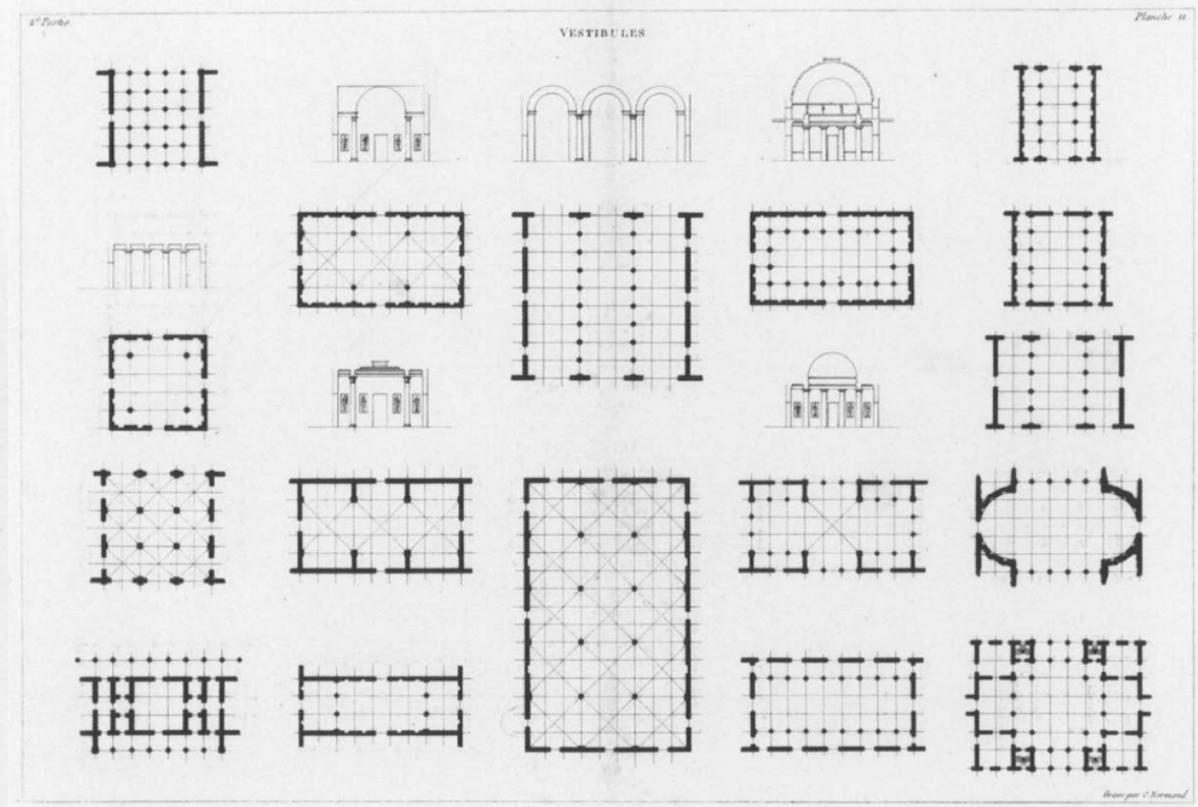
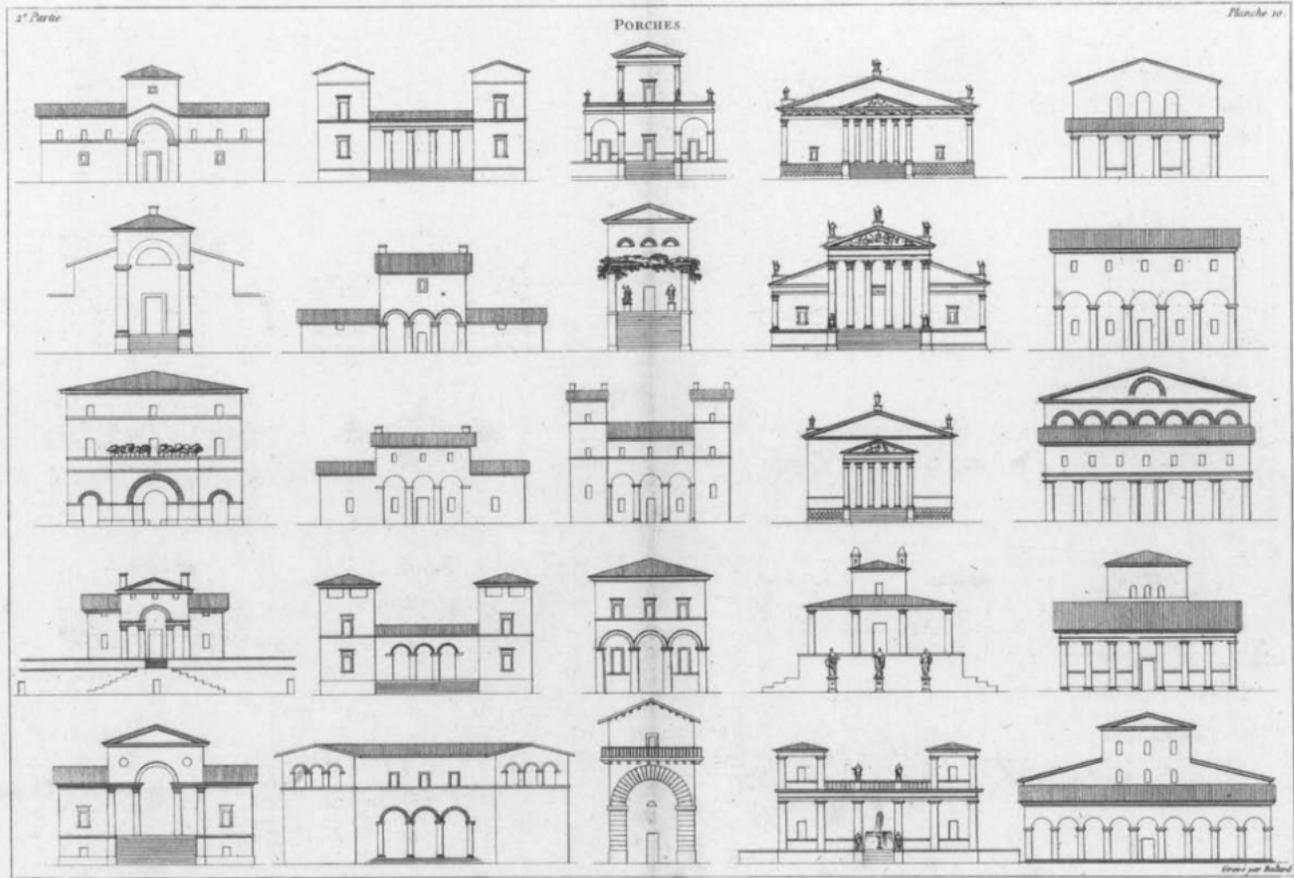


August Sander, Young Farmers, 1914



<https://flashbak.com/the-extraordinary-photos-of-german-photographer-august-sander-410620/>

August Sander, The Dadaist Raoul Hausmann [with Hedwig Mankiewicz and Vera Brodoy], 1929



J.N.L Durand – Précis des leçons d'Architecture (1802–5) vol 1 pt 2 plates 10–11

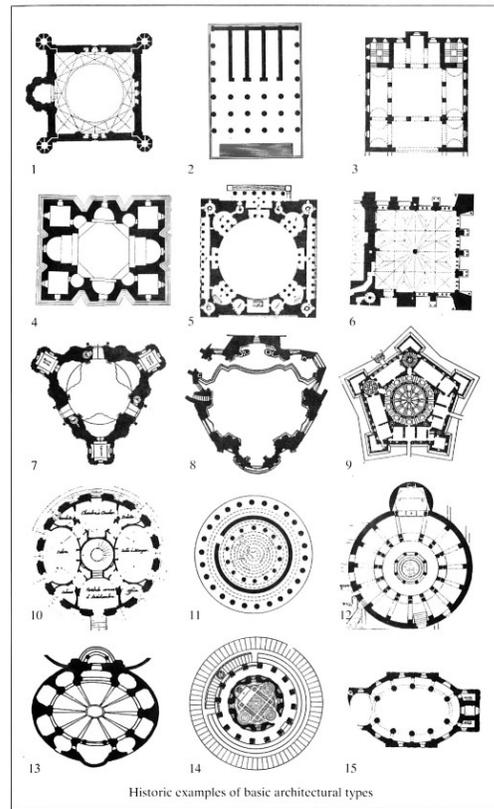
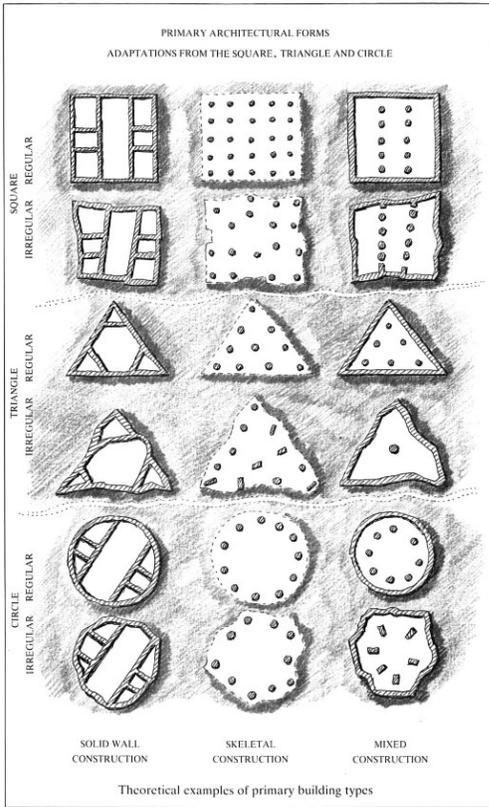
Luke Jones writes:

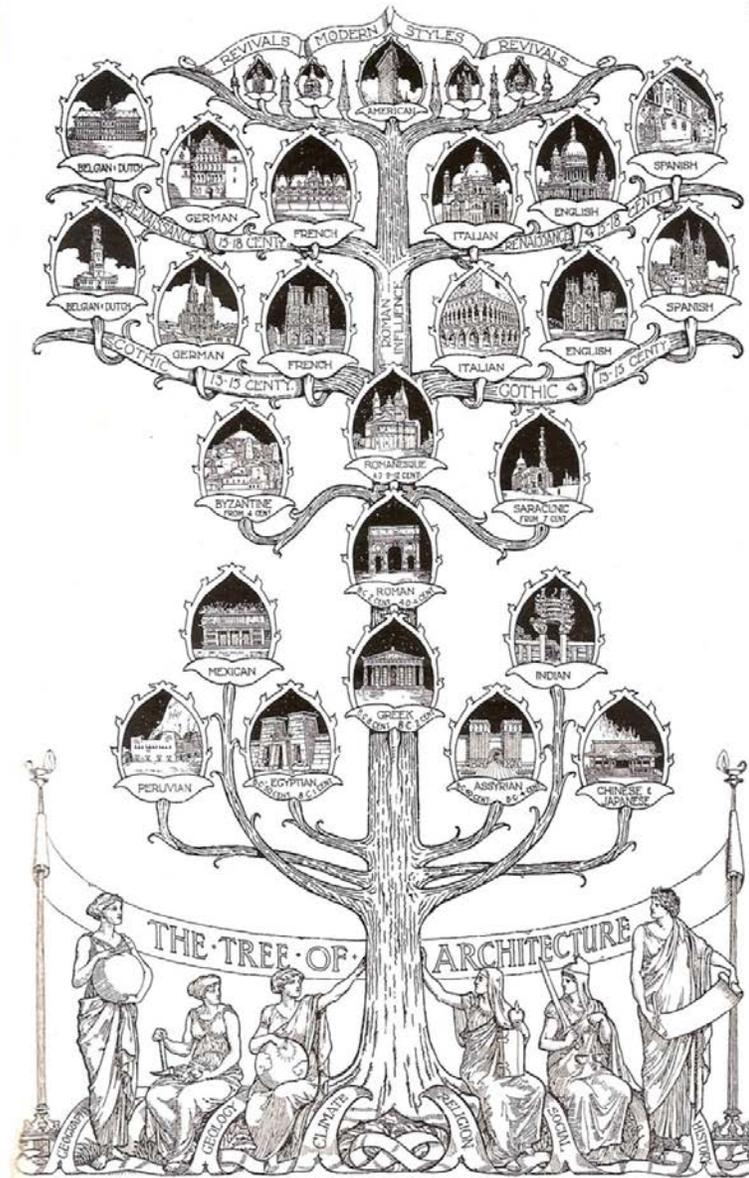
In *The Third Typology* (1977) Anthony Vidler argues that the invention of the enterprise of typology was as much about seeking *validation* for architectural form-making as it was about the systematisation of evidence. In a broad survey of the history of the idea since the mid 18th century, he identifies three currents, corresponding to *nature* (c 1750-1860), *production* (1860-1950) and *the city* (1960–).

Vidler writes:

From the middle of the eighteenth century, two distinct typologies have informed the production of architecture. The first, developed out of the rationalist philosophy of the Enlightenment, and initially formulated by the Abbé Laugier, proposed that a natural basis for design was to be found in the model of the primitive hut. The second, growing out of the need to confront the question of mass production at the end of the nineteenth century, and most clearly stated by Le Corbusier, proposed that the model of architectural design should be founded in the production process itself. Both typologies were firm in their belief that rational science, and later technological production, embodied the most progressive “forms” of the age, and that the mission of architecture was to conform to, and perhaps even master these forms as the agent of progress.

<https://medium.com/@tlukejones/on-the-three-typologies-ed0b5747fd9c>





BANNISTER FLETCHER. INV.

This Tree of Architecture shows the main growth or evolution of the various styles, but must be taken as suggestive only, for minor influences cannot be indicated on a diagram of this kind.

Left: Frontispiece of Marc-Antoine Laugier — *Essai sur l'architecture* (1755)

Right: The Tree of Architecture — Bannister Fletcher—*History of architecture* (1905)

BORN 1822.

SCIENCE possesses a learned devotee in Mr. Francis Galton—a name made famous by research in the subjects of heredity, meteorology, anthropology, and by successful scientific travel. Mr. Galton was born in 1822, and after studying medicine, graduated at Trinity College, Cambridge. For an exhaustive account of a

establishing the theory and existence of anti-cyclones. In 1886 a gold medal came to him from the Royal Society. He has been President of the Anthropological Institute and Vice-President of the Royal and Royal Geographical Societies, and is now chairman of the committee in

charge of the Royal Observatory at Kew. The present interest in finger-prints as a means of identification is almost wholly due to the writings of this indefatigable scientist.

From a [Photograph] AGE 22. From a Silhouette. AGE 12. From a [Photograph] AGE 66. From a Photo. by [Moira d. Ralph] AGE 42.

1897 Francis Galton British Eugenics poster by Paul D Stewart.

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(Réduction photographique 1/7.)

Mo^r. Galton 19.4.93

Front.	Inclin*	Racine (cavité)	Bord. o. s. p. f.	Barbe	Color* (pig*
	Haut*	Dos Base	Lob. c. a. m. d.	Cheveux	'sang*
	Larg*	Haut* Saillie Larg*	A. trg. i. p. r. d.	Car	Cuint.
	Part**	Part**	Pli. f. s. h. E	Autres traits caractéristiques :	
		Part.		Sig ^t dressé par M.	

Francis Galton, aged 71, photographed as a criminal on his visit to Bertillon's Criminal Identification Laboratory in Paris, 1893.

An anthropometry photograph of Francis Galton at age 71, taken during a visit to Alphonse Bertillon's Criminal Identification Laboratory in Paris in 1893. Bertillon originated the criminal identification programme of face-on and profile photographs together with key biometric measurements. Galton, meanwhile, studied fingerprints and published two major works on the subject.

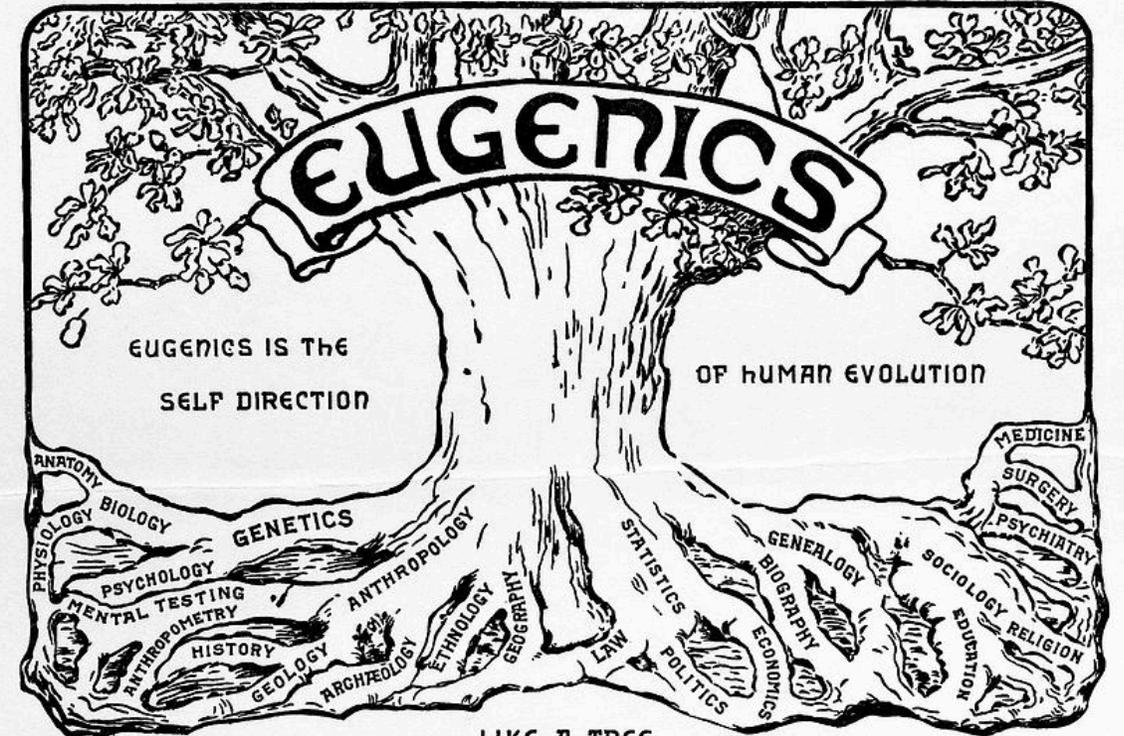
THE FEEBLE-MINDED

OR THE

HUB TO OUR WHEEL OF VICE, CRIME
AND PAUPERISM



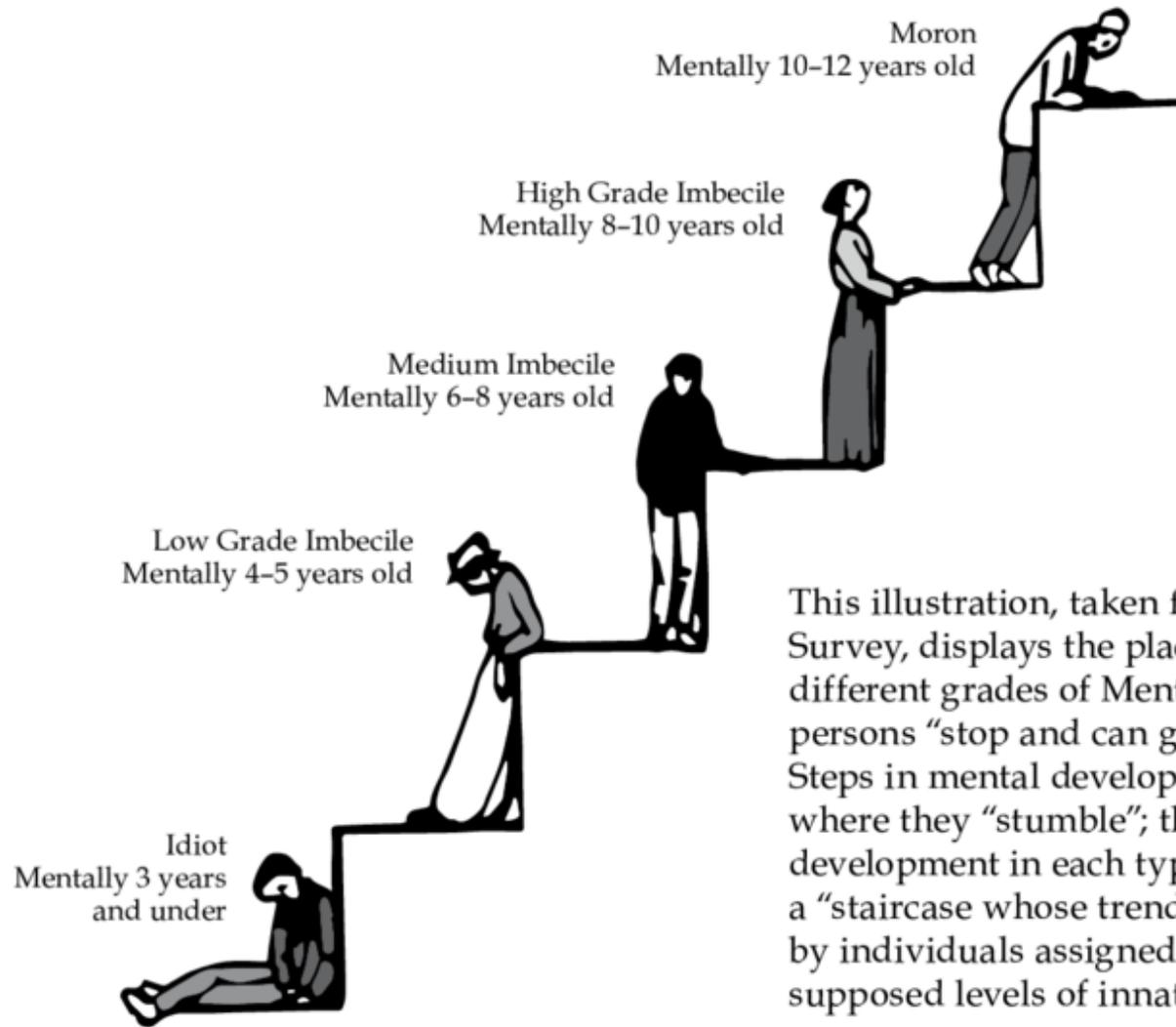
Cincinnati's Problem



LIKE A TREE

EUGENICS DRAWS ITS MATERIALS FROM MANY SOURCES AND ORGANIZES
THEM INTO AN HARMONIOUS ENTITY.

Social Darwinism



This illustration, taken from *The Survey*, displays the places where different grades of Mentally Defective persons "stop and can go no farther." Steps in mental development illustrate where they "stumble"; the limit of a development in each type is presented as a "staircase whose trends were occupied by individuals assigned on the basis of supposed levels of innate intelligence."



Courtesy of the American Philosophical Society. Noncommercial, educational use only.

Fitter Families exhibit and examination building, Kansas State Free Fair, Topeka, 1920



Supporters of the eugenics movement display signs on Wall Street (New York City, circa 1915)



Courtesy of the Robert Bogdan Collection



Eugenics and Nazi Germany



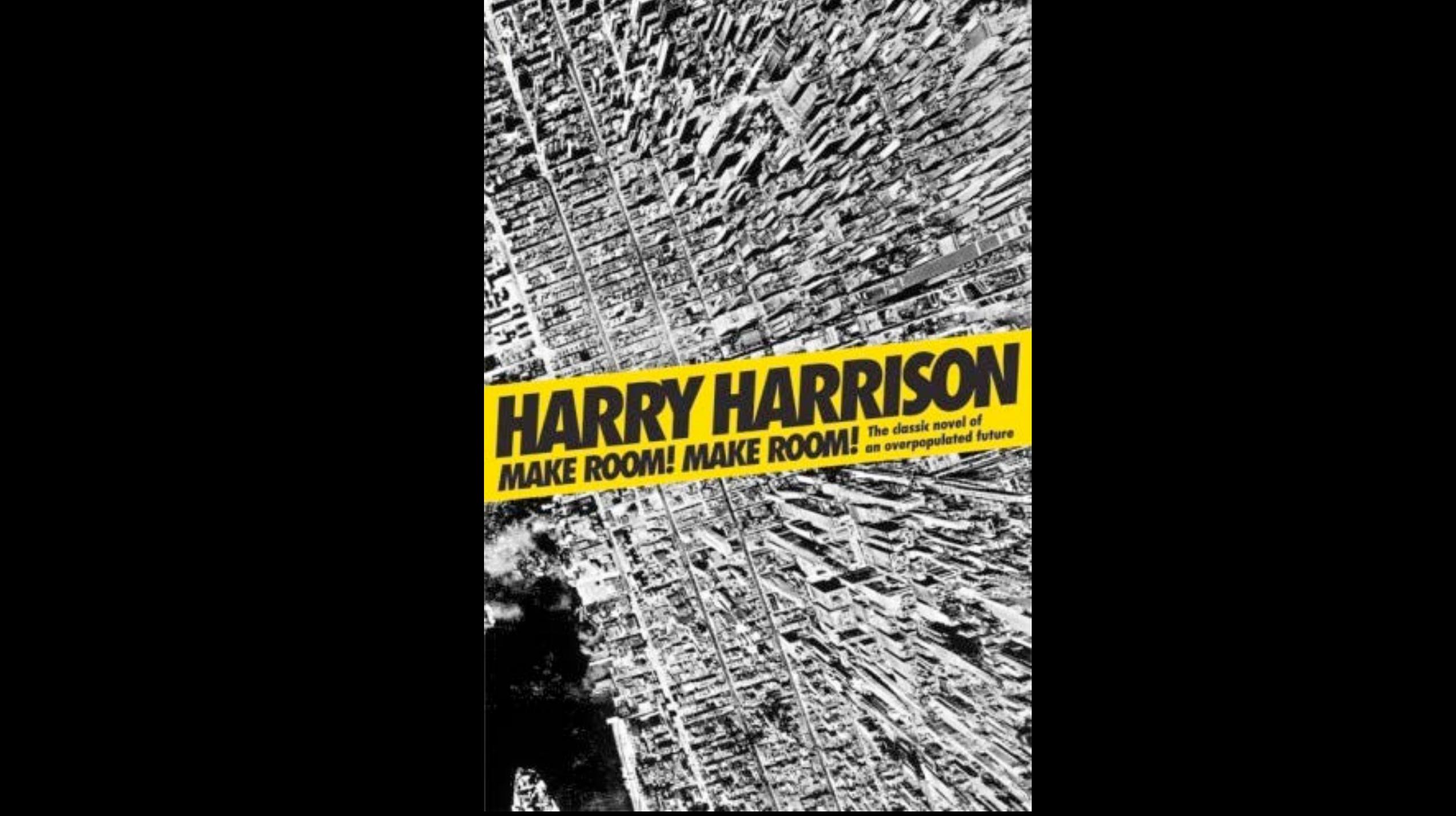
CHARLTON HESTON LEIGH TAYLOR-YOUNG

SOYLENT GREEN

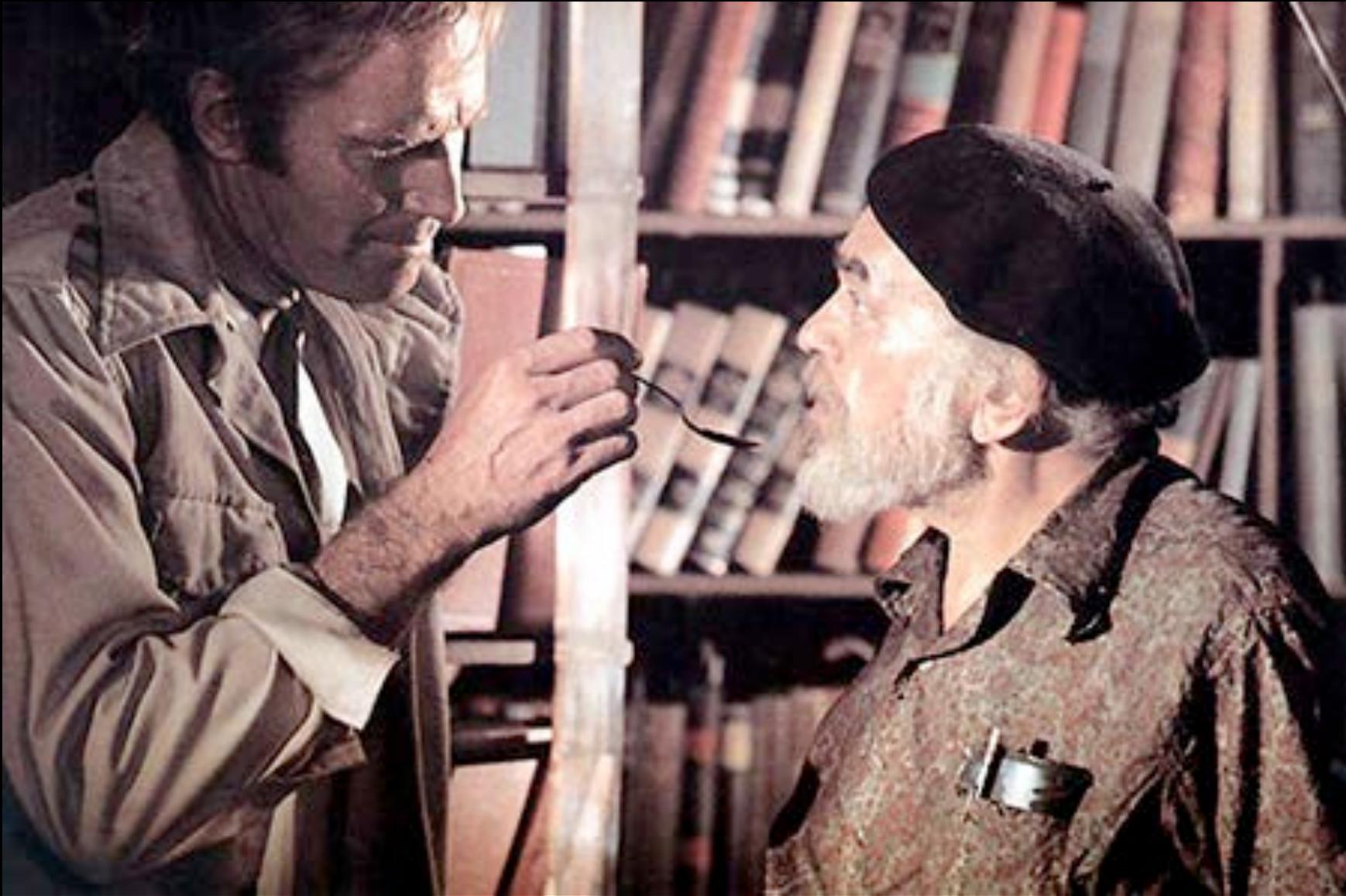


It's the year 2022. People are still the same.
They'll do anything to get what they need
and they need SOYLENT GREEN.





HARRY HARRISON
MAKE ROOM! MAKE ROOM! *The classic novel of
an overpopulated future*



Charlton Heston and Edward G. Robinson in Soylent Green



Still showing crowding in Manhattan from *Soylent Green* (1973)





Malthus and power of the exponential



"If they would rather die, they had better do it, and decrease the surplus population."

—Ebenezer Scrooge



How to Control the AMERICAN Population by Paul Ehrlich

The Population Bomb Part 1 1968



Dr. Paul R. Ehrlich

THE NEXT GREAT MIGRATION



The Beauty and Terror of Life on the Move

SONIA SHAH

Author of *Paradis*

RENNEN

CONTENTS

1. Exodus
 2. Panic
 3. Linnaeus's Loathsome Harlotry
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References

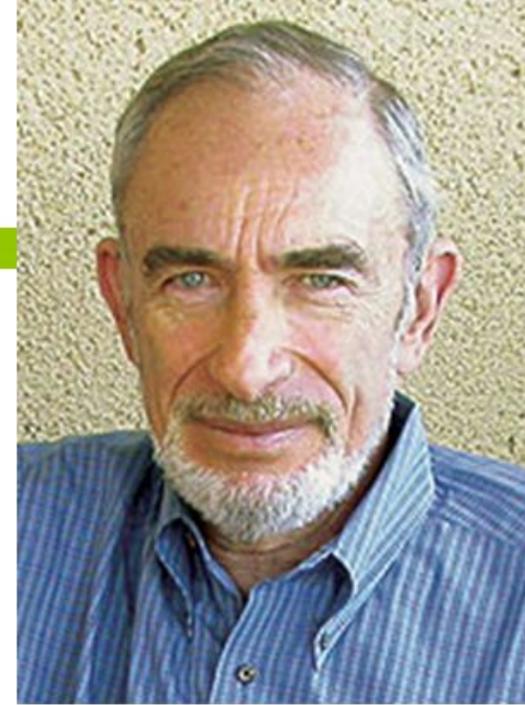
Notes

Index

A Note on the Author

Paul Ehrlich

- *The Population Bomb (1968)*
 - **Neo- Malthusian** ecologist
 - Made the argument about the ability of the earth to sustainably provide resources for an exponentially growing population.
 - Mass starvations
 - Societal uprisings
 - Raised the general awareness of population and environmental issues and influenced public policy.



The battle to feed all of humanity is over. In the 1970s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate...

Also by Koula Mellos
L'IDEOLOGIE ET LA REPRODUCTION DU CAPITAL
(co-author)

Perspectives on Ecology

A Critical Essay

Koula Mellos

Associate Professor
Department of Political Science
University of Ottawa

1 Neo-Malthusian Theory

In the late 18th century, Thomas Malthus, an English political economist, advanced a theory of crisis in his *Essay on the Principle of Population*,¹ based on a posited relation of disproportion between

AB88824



St. Martin's Press New York
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2601 N. Floyd Rd.
Richardson, Texas 75083-0643

to modify the pattern of economic activity in line with the limits of ecological scarcity. This conclusion echoes that of *The Limits to Growth* and concurs generally with those of other neo-Malthusian studies of trends and projections including subsequent reports to the Club of Rome. Indeed, the general conclusion of all neo-Malthusian assessments of present patterns of activity including the activity of breeding is the necessity of restraint to an extent determined by ecological exigencies. This proposal is the characteristic feature of neo-Malthusian social and political theory.

NEO-MALTHUSIAN SOCIAL AND POLITICAL THEORY

The social and political theory of neo-Malthusianism rests on the premise that human wants are infinite but the physical substructure necessary for their satisfaction is finite. This posited contradiction is resolved by an activity consistent with natural exigencies and physical finitude. This is essentially an activity of restraint both in the quantitative sense of limiting wants and in the sense of limiting the technical means of satisfying them to those compatible with ecological exigencies. The activity of restraint is politically determined such that allowable forms and degrees of activity are specified and monitored. It is thus an externally imposed restraint on the individual's activity. The individual does not freely define objectives and does not freely determine means to achieve them, but is rather subordinate to the political structure as one of control and surveillance of activity in line with ecologically determined criteria.

In examining this theory we shall argue that the premise of unlimited human wants is the Hobbesian liberal assumption of human nature as insatiably acquisitive. This classical liberal anthropology has been interpreted¹⁹ as being bourgeois in the sense of conceiving human nature on the model of the private, bourgeois individual who achieves his or her essence in the activity of private accumulation, or, in other words, private property. Neo-Malthusianism, we shall argue, implicitly assumes a human nature and the form of human nature it posits is private. Implicit in neo-Malthusianism is that the activity of private appropriation is basic to human nature. We shall argue that this anthropological assumption of private nature together with the assumption of insurmountable physical finitude underlie the theory of politically determined restraint. Physical ecology, rather than determining the form of this activity, merely sets the

quantitative boundaries within which activity can proceed. Since human nature is essentially private in neo-Malthusianism, this activity as an expression of human essence is private appropriating activity. The political theory of restraint thus is a theory of quantitative restraint of the amount of private property an individual may acquire.

Our interpretive hypothesis that a Hobbesian liberal anthropology underlies neo-Malthusian theory seems at first sight incorrect. Classical liberalism, after all, is a champion of individualism and neo-Malthusianism is vehemently critical of individualism. We find in neo-Malthusianism a depiction which is not altogether flattering of the independent individual as being excessive, irresponsible, chaotic, defying rather than obeying the laws of nature and creating harmful and destructive ecological and social conditions. He or she lacks a sense of moderation and control and depicts the predominant role as that of maximising a personal share of resources and of extracting as much from nature as possible. The individual exercises no restraint on personal appetites and, lacking all sense of frugality, remains insensitive to nature's limited capabilities. Ecological damage is thereby inflicted in proportion to the excesses of uncontained appetites.

This depiction of the individual stands in sharp contrast to the post-Hobbesian classical liberal conception, particularly that of Adam Smith. For neo-Malthusians the unrestrained individual leads to ecological and social destruction and for classical liberalism this same unrestrained individual leads to social well-being or in Adam Smith's words, 'the greatest good for the greatest number'. The difference lies in the opposing judgement of the same perception of the individual and this common conception derives from the common anthropological theory of human nature. For both classical liberalism including Hobbesian liberalism and neo-Malthusianism, unrestrained activity is an expression of human nature. But this free activity of classical liberalism is conceived as being a rational activity. It is rational because it is determined by reason and it is the individual who is the sole source of rationality. He or she defines personal goals, and develops devices to achieve them. Rational unrestrained activity is not the activity of Hobbes's state of nature 'of war of all against all', although that which is exercised in such a natural state is indeed unrestrained. That which distinguishes between rational unrestrained activity and irrational unrestrained activity is the relation between individuals. Since reason is the property of the

individual no external source of authority should tamper with it. Unrestraint, then, refers to the freedom of the individual to exercise his reason according to his own volition. This, of course, implies a relation of equality in the exercise of reason such that one does not constrain or impede the exercise of reason of the other. Competition is conceived as a wholly rational means by which individuals seek to achieve their own goals. It is a modality of action of equal and free individuals. It is in this exercise of individual rationality that human nature is expressed freely.

The key to the opposing judgement of individualism between classical liberalism and neo-Malthusianism is the relationship drawn between private individual rationality and public common good. For classical liberalism there is consistency, compatibility between the two. The interest of the private individual and the common interest is dependent on the private interest in the sense that unhampered, unimpeded activity to achieve private interests satisfies as well the common interest. There is no contradiction between the two since the common interest collapses into the private interest and becomes one with it. In neo-Malthusianism the relation between private and public interest is not one of harmony but of contradiction. Unrestrained activity in the pursuit of private interests leads to what Garrett Hardin calls 'the tragedy of the commons', i.e. depletion of resources, uncontrollable pollution and overpopulation. The resolution of this contradiction is evident for neo-Malthusianism. It is the subjection of private interests to the common interest.

The neo-Malthusian notion of unrestrained activity is not entirely equivalent to that of classical liberalism although the differences are minor and do not affect but rather serve to reveal their common anthropological basis. The 'unrestraint' character of the activity is conceived as relating more to the quantitative aspect of this activity than to the form of the activity itself. Private reason gets 'carried away', in a sense, and makes quantity its objective. Producing or acquiring more and more of this and more and more of that is unrestrained activity. It is propelled by unlimited wants including the want to have children. But although this quantitative aspect of unrestrained activity is emphasized, it is linked to the free individuals of classical liberalism (and indeed is enlarged to include the free corporate groups of neo-liberal pluralism) by the postulate of human nature as infinitely acquisitive.

If human wants are infinite they will be converted into quantitatively maximising activity by the free expression of the individual (or

THE NEXT GREAT MIGRATION



The Beauty and Terror of Life on the Move

SONIA SHAH

Author of *Paradise*

REYNOLDS & RYAN

CONTENTS

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 4. The Deadly Hybrid
 5. The Suicidal Zombie Migrant
 6. Malthus's Hideous Blasphemy
 7. *Homo migratio*
 8. The Wild Alien
 9. The Migrant Formula
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- Coda: Safe Passage

Acknowledgments

References

Notes

Index

A Note on the Author

"All the News
That's Fit to Print"

The New York Times

LATE CITY EDITION

Weather: Cloudy, rain likely today and tonight. Partly sunny tomorrow. Temp. range: today 64-50; Wed. 67-46, Full U.S. report on Page 73.

VOL. CXIX... No. 40,997

© 1970 The New York Times Company.

NEW YORK, THURSDAY, APRIL 23, 1970

10 CENTS

**PRICES CLIMB 0.4%
BUT RATE OF RISE
APPEARS TO SLOW**

Gain in the Consumer Index for March Lags Behind the 4 Previous Months

INCREASE IS STEEP HERE

Medical Care and Mortgage Interest Are the Major Elements in Changes

By EDWIN L. DALE Jr.
Special to The New York Times

WASHINGTON, April 22—Consumer prices rose strongly again in March but there were signs that the pace of inflation was slowing, the Labor Department reported today.

After adjustment of the data to reflect normal seasonal changes, the Consumer Price Index rose four-tenths of 1 per cent in March, less than the five-tenths rise in February and the six-tenths rate of the three months before that.

What is more, one-quarter of the entire March increase in the index was accounted for by a somewhat artificial recording of an increase in Veterans Administration mortgage interest rates. The ceiling on these rates was recently raised by

Millions Join Earth Day Observances Across the Nation



Thongs jamming Fifth Avenue yesterday in response to a call for the regeneration of a polluted environment. View is north from 43d Street, with Central Park in background. The New York Times by Patrick A. Burns

**CAMBODIAN CRISIS
GROWS AS TROOPS
SEEM TO FALTER**

With Reds Near, Phnompenh Is Gloomy Over Limited Response to Aid Pleas

CIVIL AVIATION CURBED

Aide Declines to State How Long Army Can Hold Out With the Arms It Has

By HENRY KAMM.
Special to The New York Times

PNOMPENH, Cambodia, April 22—An atmosphere of heightening national emergency is overtaking Cambodia.

It is due to evidence that the Cambodian Army is unable to turn back the Vietnamese Communist forces, which at one point are within 15 miles of the capital, and to the limited response to Premier Lon Nol's appeal to all nations for arms aid.

The military authorities closed the Phnompenh airport this evening to all civilian traffic. According to military sources, it is to remain closed until tomorrow in connection with an important military operation. The operation is presumably intended to dislodge the North Vietnamese and Vietnamese forces from the

Neo-Malthusian Concern #1

#1 SUSTAINABILITY: When the population reaches 10 billion, there may be problems keeping up with food demand.

- Soil erosion
- Soil nutrient loss
- Depletion of irrigation sources (water)
- Soil salinization (salt accumulation)

**U.S. CONCERN SUED
WITH 2 IN JAPAN**

**Mood Is Joyful
as City Gives**

**Activity Ranges
From Oratory**

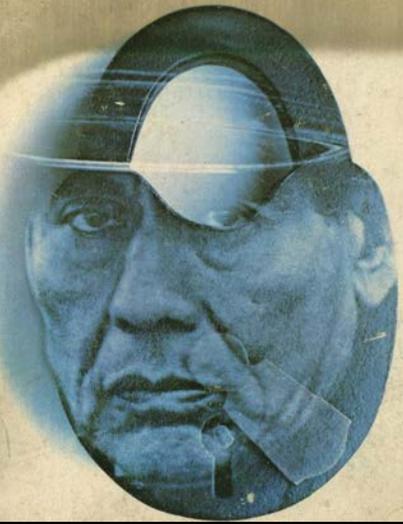
**BACKERS OF ROJAS
THREATEN REVOLT**

**U.S. Plane Flies In Arms
As Trinidad Fights Mutiny**

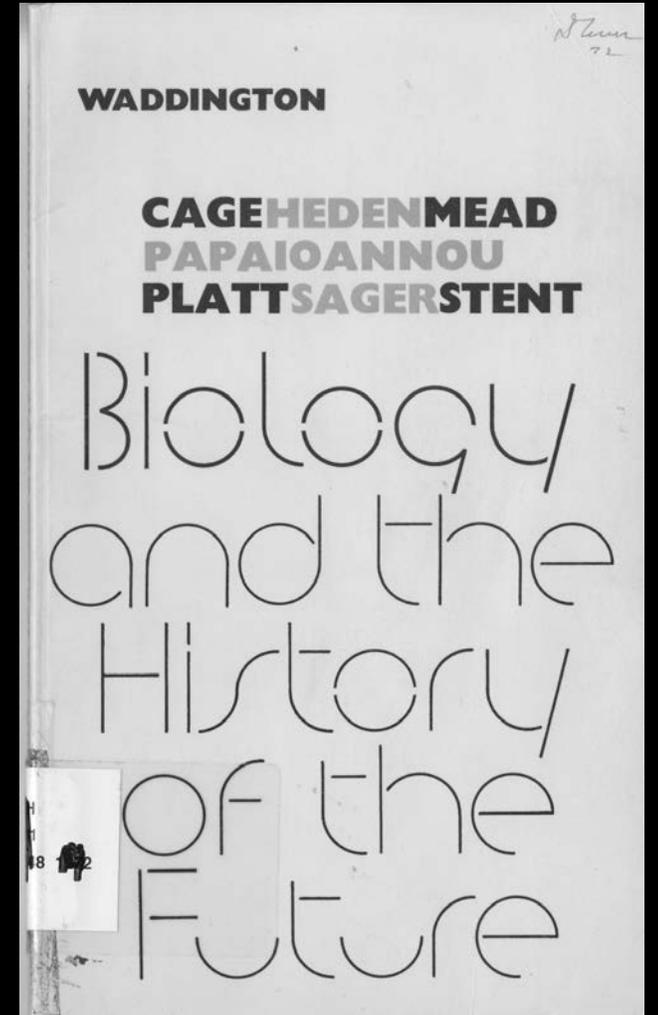
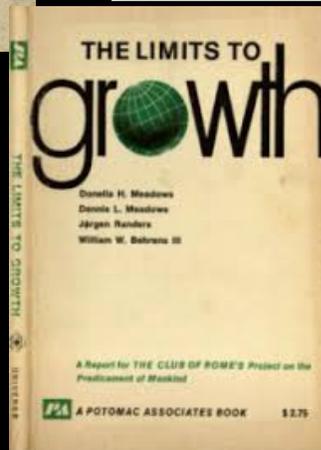
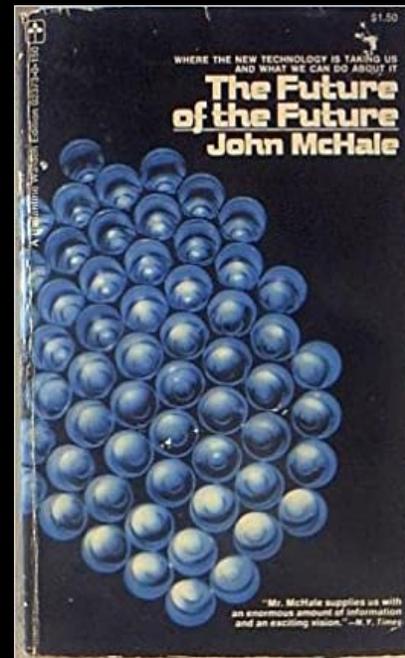
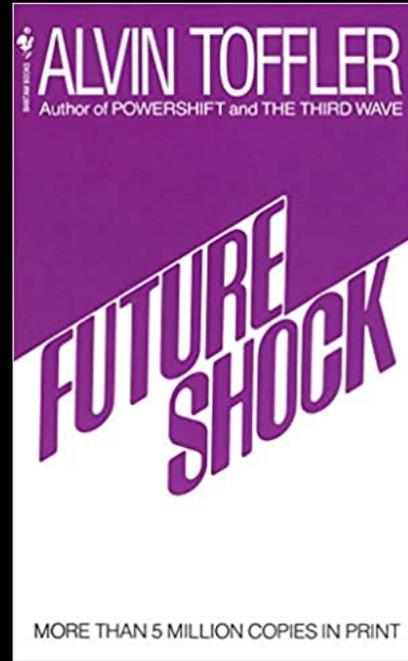
the futurists

Arthur C. Clarke, Paul Ehrlich, R. Buckminster Fuller, Herman Kahn, Marshall McLuhan, Margaret Mead, Alvin Toffler, Anthony J. Wiener, Robert Jungk, Arthur I. Waskow, John McHale, Olaf Helmer, Theodore J. Gordon, M. S. Iyengar, Erich Jantsch, Daniel Bell, I. Bestuzhev-Lada, Kenneth E. Boulding, Bertrand de Jouvenel, Yujiro Hayashi, Ossip Flechtheim, Fred L. Polak, John Wren-Lewis

edited by Alvin Toffler



Futurology and Future Studies



Some facts you should know



Coke Time... and all is well

IF YOU ARE SINGLE AND DON'T WANT TO BE:

FALSE TEETH
KLUTCH holds them tighter

Do I use the pronoun

Do I have a deep interest in

Do I laugh with affection?

Do I have any ingredient

do I "roll with the punches"?

do I feel a surge of jealousy?

**DON'T SHOOT
ARTHUR!**

**MANY NEVER
SUSPECT CAUSE
OF BACKACHES**



**SHE PINS UP
THE POISON
PEN CARDS**

Why
Not

WHY I TOOK

to the washers

in luxury flats

**Where travellers' cheques
are slave girls**

THREE scoundrels of Araby are on the
warpath again. . . They are
whooping over the silent roads in



2



John McHale 54

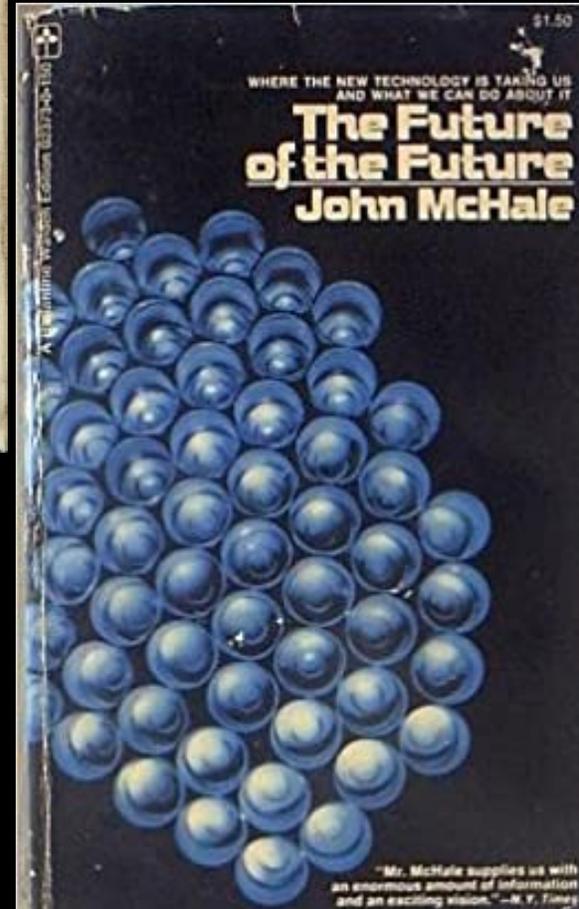


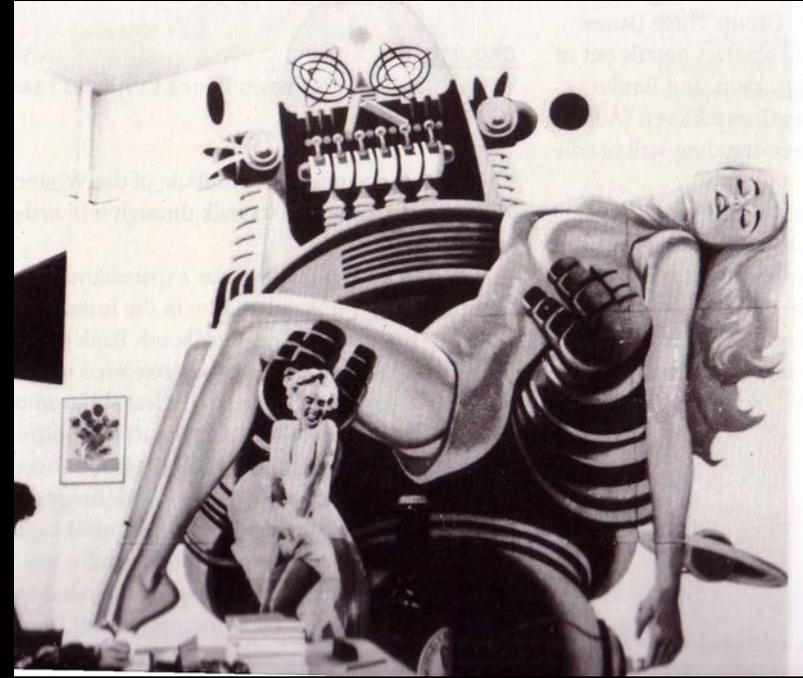
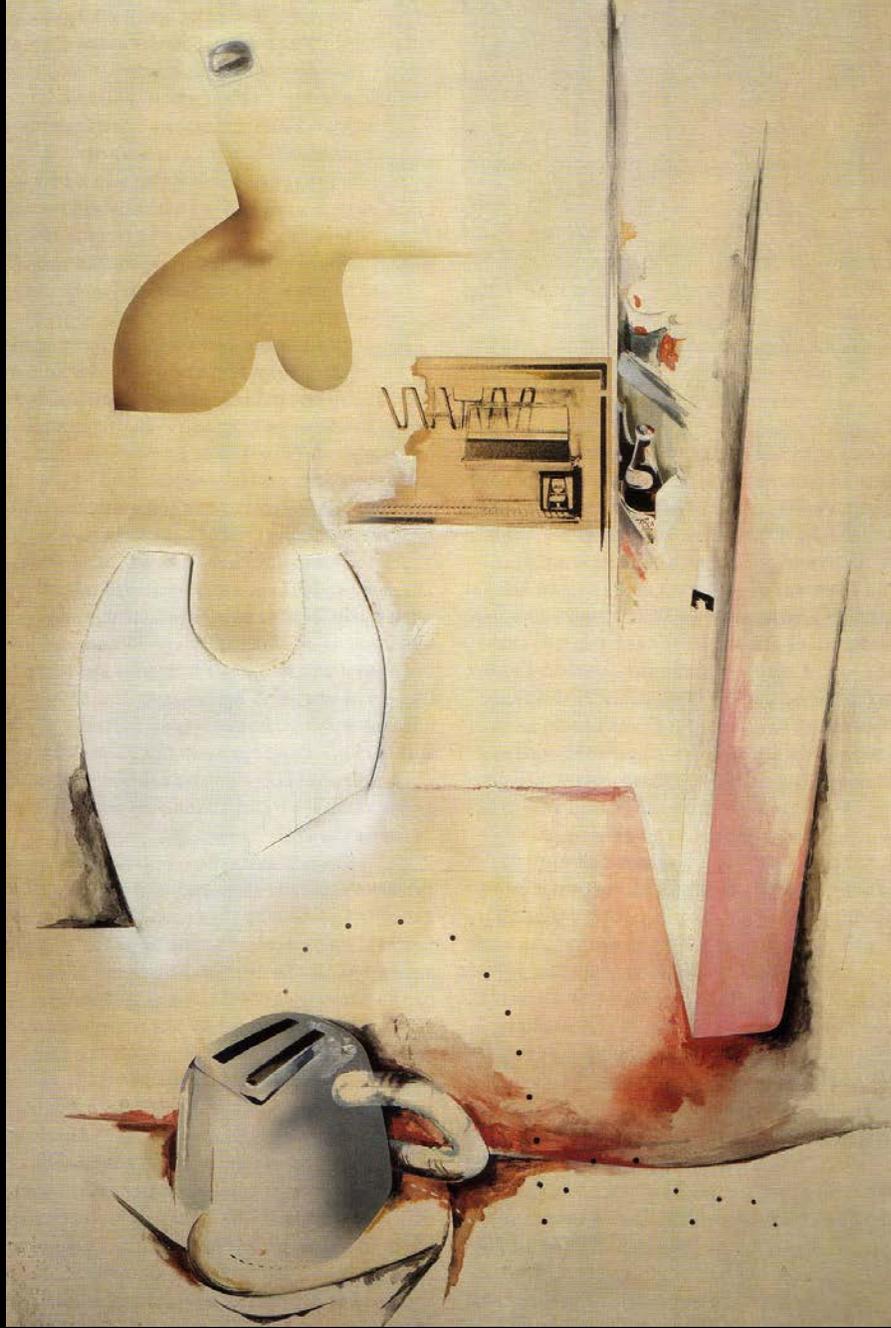
THE ECOLOGICAL
CONTEXT

JOHN McHALE

John McHale, "Why I Took to the
Washers

In Luxury Flats," 1954, collage book

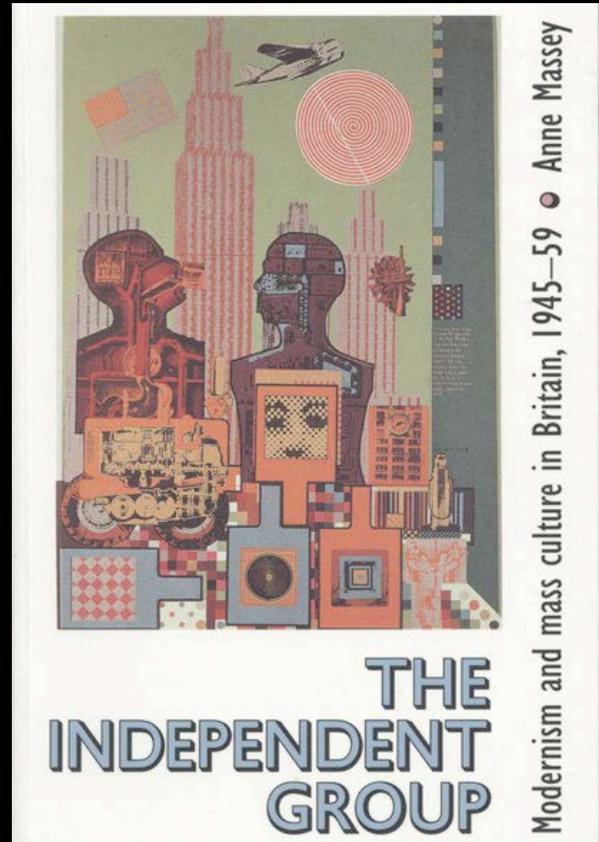




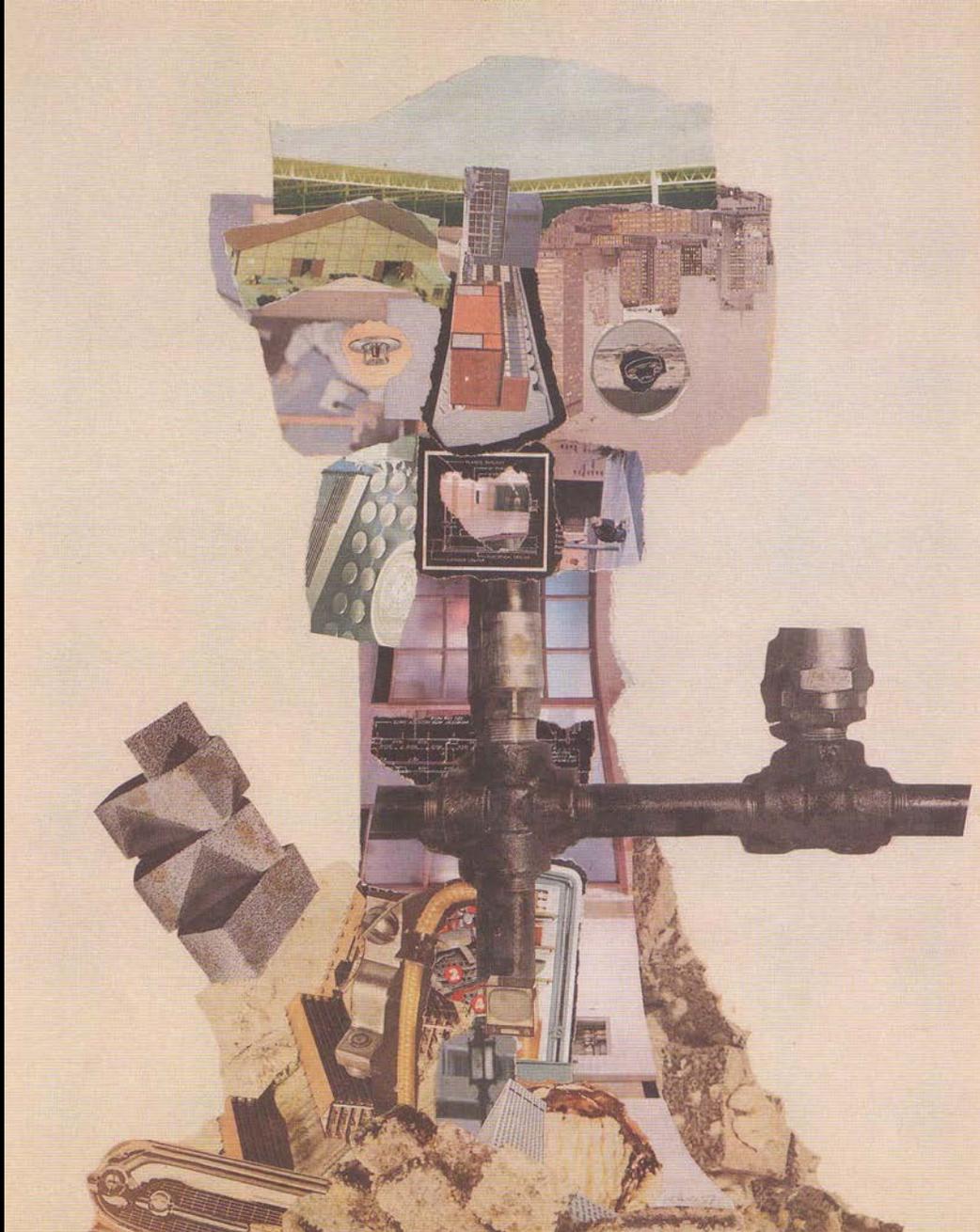
Modern Sources:
**American
Consumerism**
Science Fiction

Book cover from
*The Independent
Group's Modernism
and Mass Culture in
Britain 1945-59*
exhibition

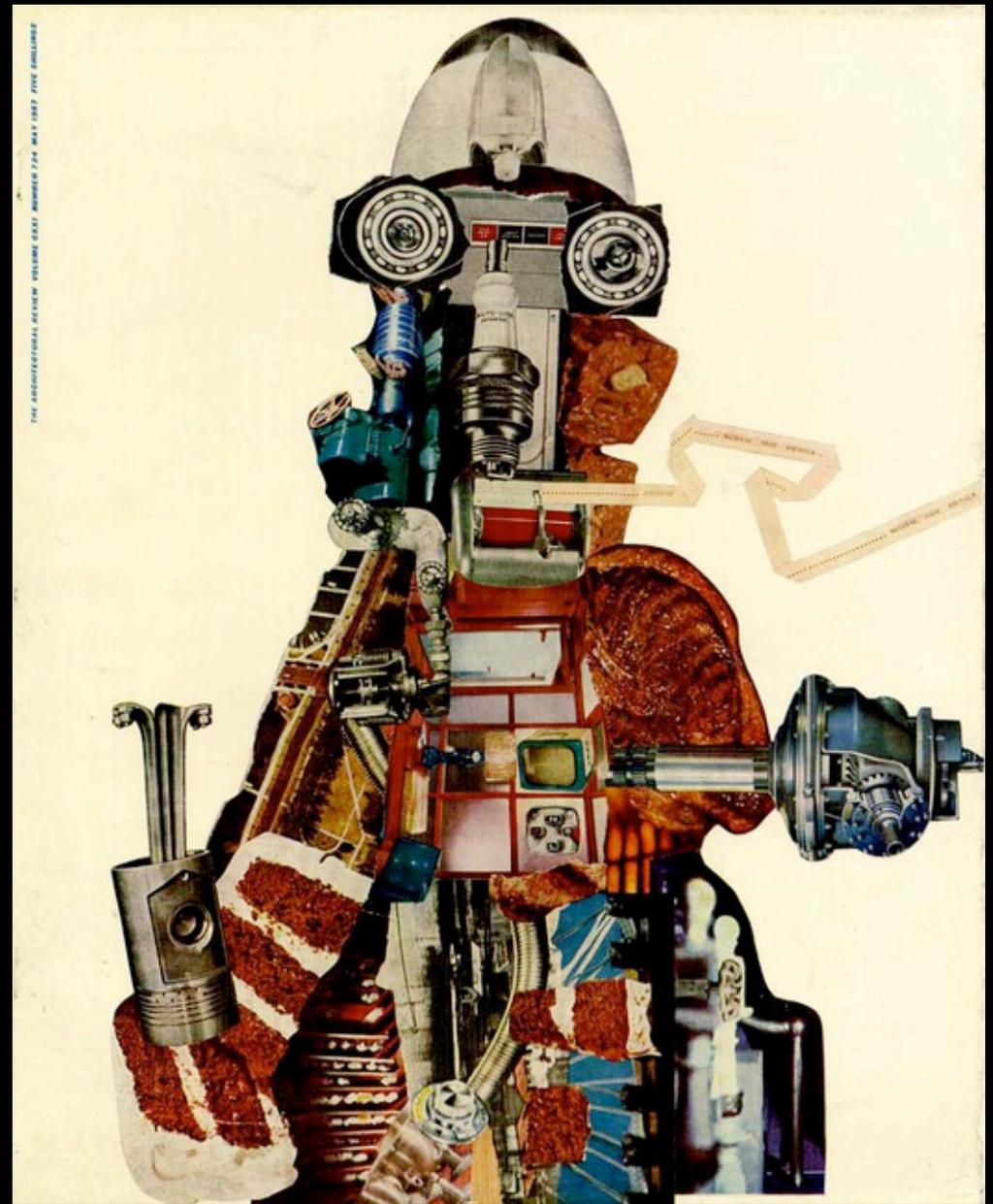
Eduardo
Paolozzi "Wittgenst
ein in New York,"
1964



Richard Hamilton, *She*, 1958-61; oil and collage on panel



John McHale, "Machine-Made America I," 1956-57, collage



John McHale, "Machine-Made America II," 1956-57, collage

MARGINALIA

Marginalia, like this month's cover, and his own spare head (right, a collage sculpture of beer-packs and string) has been assembled from machine-made Americana by John McHale, Glasgow-born collagist, biographer of Buckminster Fuller (AR, July, 1956) and recent special student under Josef Albers at Yale.

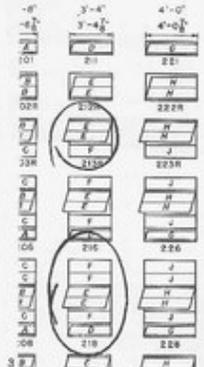


Eames catalogue building
At this time distant, it seems remarkable that no sharp West Coast speculator has yet emulated the enterprise of Charles Eames, and produced a 'U-hold-it' kit for a full street house, or perhaps, at lesser remove, something on the lines of the 'containing' items, advertised in U.S. car magazines, for giving that personal touch to the family auto. But, no doubt, even given such ac-



men, the Eames 'Catalogue' house would still stand as an unique and completely individual essay in means aesthetics. The view of the house shown here 1, is of the living room end, where the bedrooms occupy the second storey; the overprinted numbers on the window elements are the types, chosen by the architect, from the catalogue of the Truscon Steel Co. It, gives a detail of the actual page section of the company's 'Architectural Projected Windows' with Eames' own notations.

In between extracting components from catalogues, and seeing their own designs get into catalogues, Charles and Ray Eames have contributed a chair to one generation, produced toys to confound the next, and turned out a series of original essays in film. Contrary to museum, the sequel to 'A Communications Primer,' one of the latter, is not, Eames says, 'to be called "Son of Communications"' or "Communications Risky Again"—but "Theory of Feedback." Although the relationship of these film projects to architectural and other designing may seem tenuous, Eames does emphasize its relevance. His point becomes clearer when one considers the way in which I.B.M. have used Eames as a consultant—not on the design of actual products—but charged with carrying the designer's attitude into other management areas. His latest design is in



the same territory of Communications—a loudspeaker enclosure 2, the 'Quadreflex,' designed in collaboration with Stephens Truscon engineering staff.

Fuller: global encirclement
Though more amenable to catalogue treatment, and mass production, than the traditional building, the geodesic dome is still, generally, on a one-off basis, individually tailored to specific requirements. But the recent licensing, by Fuller, of commercial fabrication to produce dozens, may change the situation. The biggest dome yet 4,—all aluminium, 144 ft. diameter and 57 ft. high—has been turned out by Kaiser Aluminium Co. This was erected in 20 hours by 38 men for a resort auditorium in Honolulu to seat 1,800 people. With locations such as this, Fuller does not seem geographically wide-spread; radars in the Arctic, a concert hall in the South Seas and the recent one in Kabul, Afghanistan. This latter, the Kabul Dome, 100 ft. diameter, of aluminium tube and nylon skin, was designed for the U.S. pavilion in the International Trade



Fair held there, and housed, among other items, an 80-ft. Cinemascope screen. From initial inquiry by the client, through designing, fabrication, transport, to final erecting on the site, took around 8 weeks. After Kabul, it is touring the Far East, and will eventually come to Europe this year.

'Good to look at, pleasant to hold'
From General Motors pop, look on styling, the above quote refers to an example of hand sculpture from Pratt Institute 5, which shares page honours



with a vacuum-type coffee machine, fender detail from a Pontiac dream car—and an egg. Earlier in the same document, visuals of frontier axes, Kentucky rifles and duelling pistols (as well as a miscellany ranging from



Gothic armour to fine china) list at a lineage for auto styling via the American tool-making tradition. Superficial visual parallels might be drawn when one compares a particularly over-iced match rifle 6, the Hamwell MJ 452, with 7, the rear end of the 'Right Sweep Year' Chrysler '67, but the real cause for the curvy plastic bulging is implicit in current consumer preference, and these mass directly original to car styling itself, as source, than the ergonomic hand tool. (These issues were fully discussed in AR April 1955, Machine Aesthetic, Reynier Danham.) Essentially the point, nowadays, about the auto is, that you don't handle it, but, see 9, Plymouth

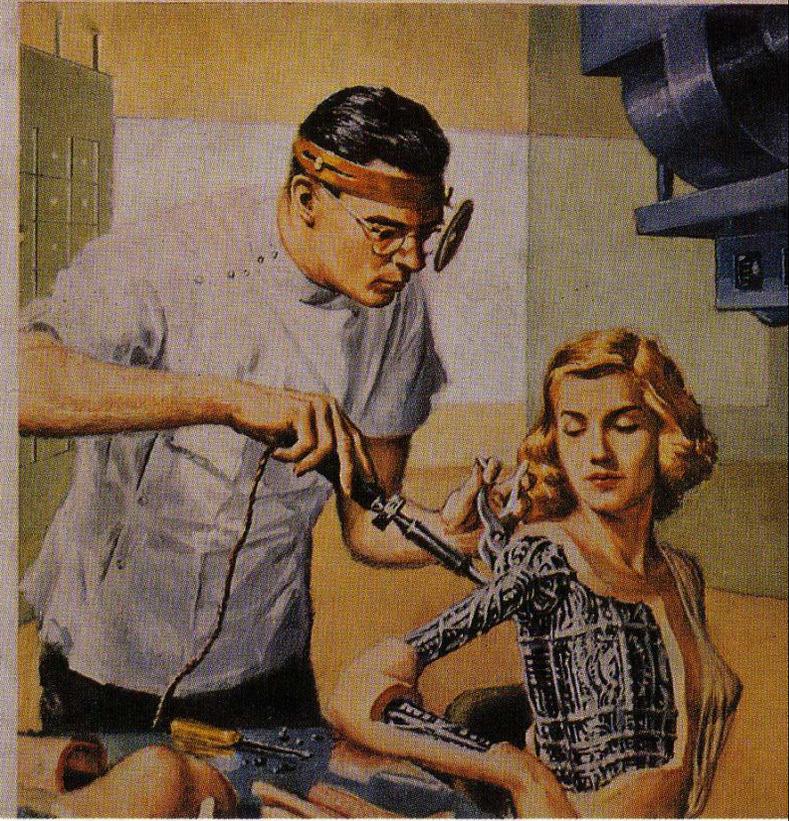


and eye piece worn in its hub contours, the desk provides much manipulative therapy for the active executive by way of pushbutton panels for lighting, temperature and TV control, as well as a built-in waste basket.



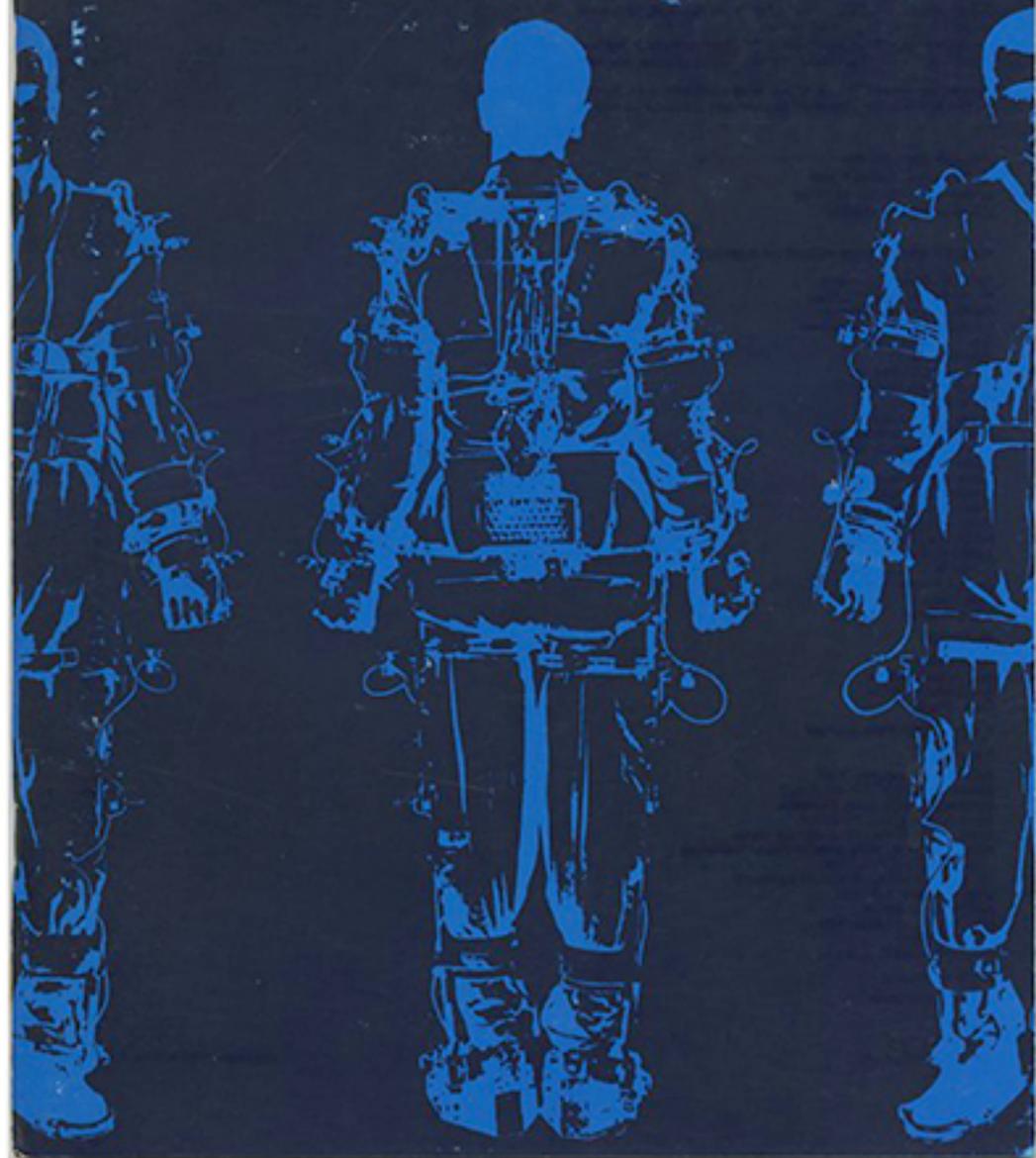
Galaxy

SEPTEMBER 1954
35¢
THE MAN WHO WAS SIX
By F. L. Wallace



Cover used by
McHale as
illustration for
This is Tomorrow
Exhibition,
Institute of
Contemporary
Arts, London,
1956

Toward the Future / DESIGN QUARTERLY 72



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY

Illustration of a large vehicle in orbit. The vehicle is a large, cylindrical structure with a conical nose and a tail section. It is shown in a three-quarter view, orbiting a planet. The planet's surface is visible in the background.



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY

DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY



DESIGN BY GERALD FINE, UNIVERSITY OF CALIFORNIA, BERKELEY



Model of lunar rover, designed by NASA, showing the use of a bubble-like cabin.



Small lunar rovers, designed by NASA, showing the use of a spherical shape.



Model of lunar rover, designed by NASA, showing the use of a mechanical leg.

Model of lunar rover, designed by NASA, showing the use of a bubble-like cabin.

Model of lunar rover, designed by NASA, showing the use of a bubble-like cabin.

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Model of lunar rover, designed by NASA, showing the use of a bubble-like cabin.



Model of lunar rover, designed by NASA, showing the use of a mechanical leg.



Helen and Newton
Harrison, Portable
Orchard, 1972/2015





Left: Haus-Rucker-Co, 'Environment Transformer/Flyhead Helmet', 1968

Right: Group Haus-Rucker-Co, Austrian architects Laurids Ortner, Guenter Zamp Kelp, and Klaus Pinter

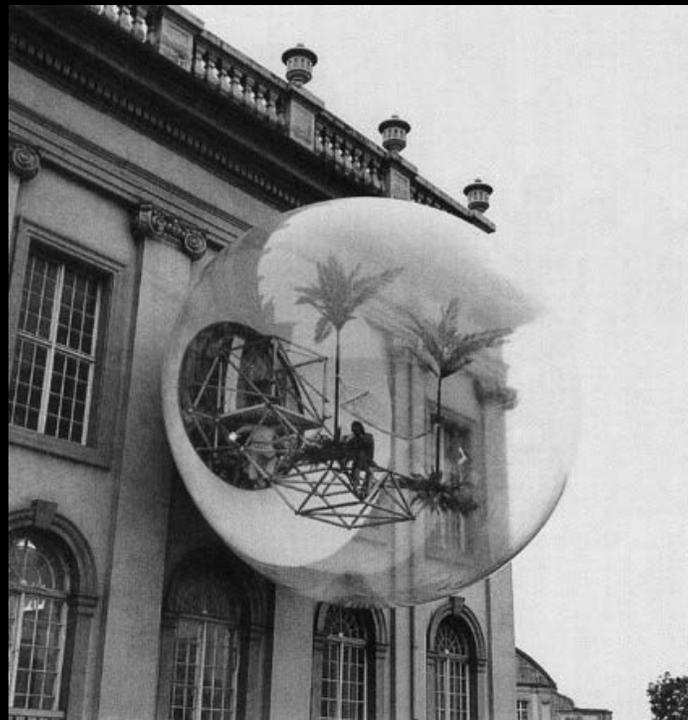




“Architects must cease to think only in terms of buildings.” The dazzling array of architectural inventions Austrian group Haus-Rucker-Co. affirms Hans Hollein’s plea in his 1968 *Bau* magazine essay, “Everything Is Architecture.” Founded in 1967 around a “Mind Expanding Program” (MEP), Haus-Rucker-Co aspired to extend people’s psycho-physical experiences through art and architecture. Hailing from Freud’s hometown, these Vienna-based architects were, unsurprisingly, fascinated with the “inner space” as much as with the physical built environment.

Beyond buildings, Haus-Rucker-Co infused architectural principles—re: form, function, content, structure, space, effect, spectacle, and meaning—into expendable commodities, producing highly imaginative designs to, so the story goes, send their users on a psycho-physical journey.

Haus-Rucker-Co, 'Environment Transformer/Flyhead Helmet', 1968

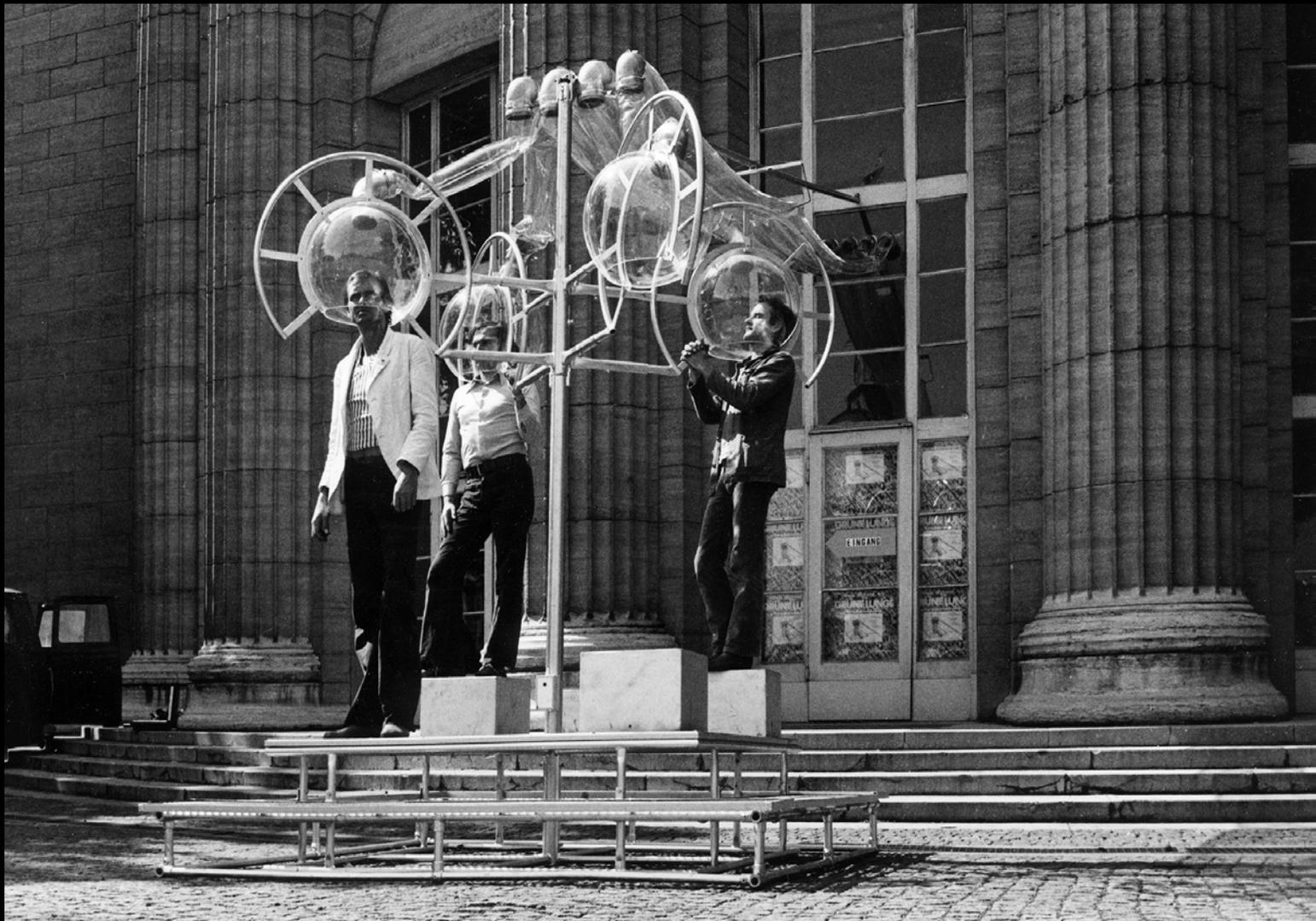


Haus-Rucker-Co., Oasis
Number 7, 1970

“Our balloons will help you to discover an unknown feeling of tranquility, of security, of relaxation. And love. We want to heighten your sensitivity. You will take a journey. Together with someone you love. Into inner space. Like Astronauts. Only an inward trip. You will attain a higher level of thinking and loving...”



Haus-Rucker, Flyhead Viewatomizer and Drizzler, 1968



Haus-Rucker-Co, *Grüne Lunge* (Green Lung),
outdoor installation at Kunsthalle Hamburg, 1973



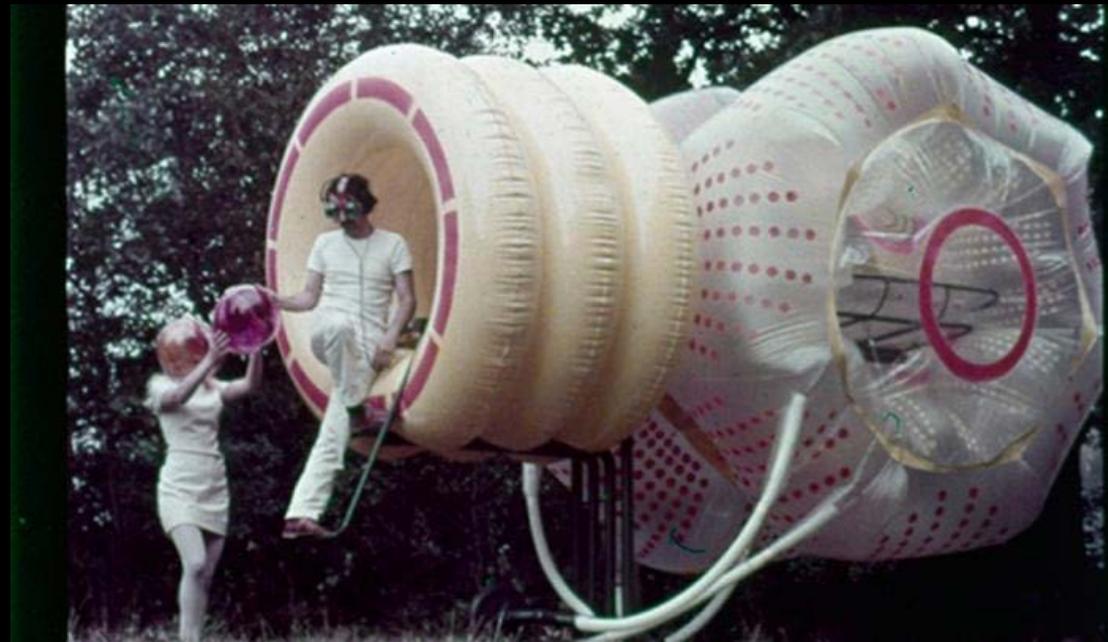
Haus-Rucker-Co. 'Mind Expander' 1967

No longer oriented side by side, the couple now sat with the woman on the man's lap, their legs conspicuously entwined. In this position, the man would reach down the overhead cover and turn on the rhythm machine. A psychedelic journey then began.





Haus-Rucker Co., Yellow Heart, 1968



PLUS-MINUS-ZELLEN

SCHLEUSE

B

B

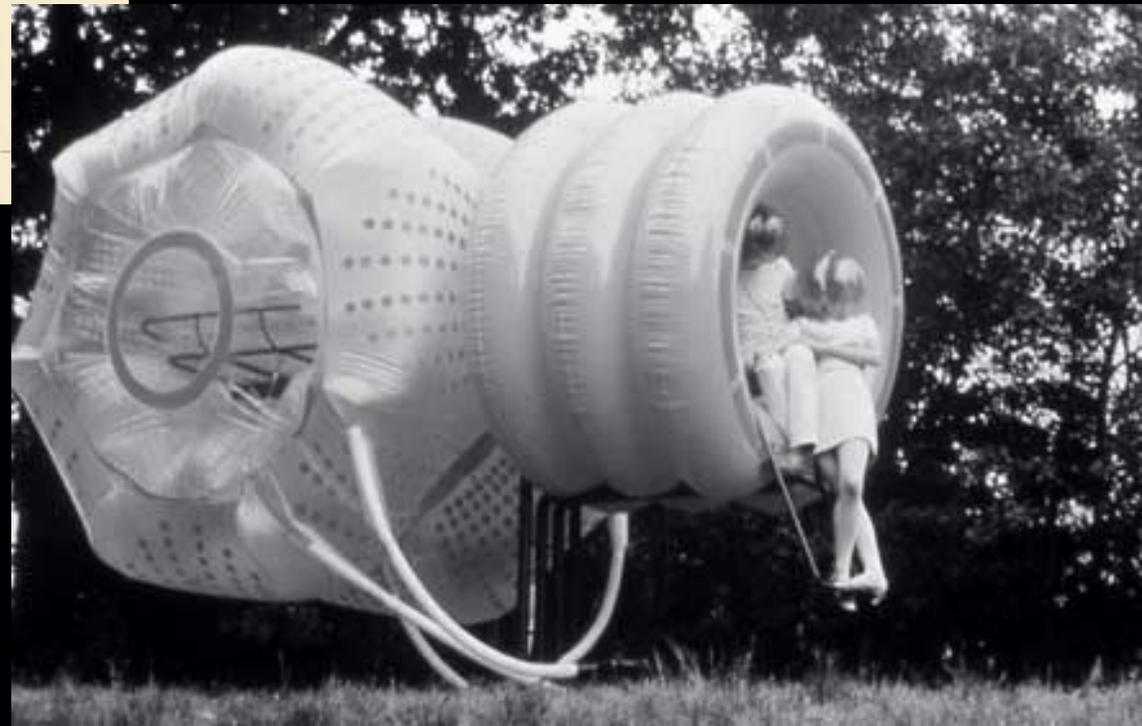
PNEUMATISCHE
PLATTFORM

ZULUFT ABLUFT

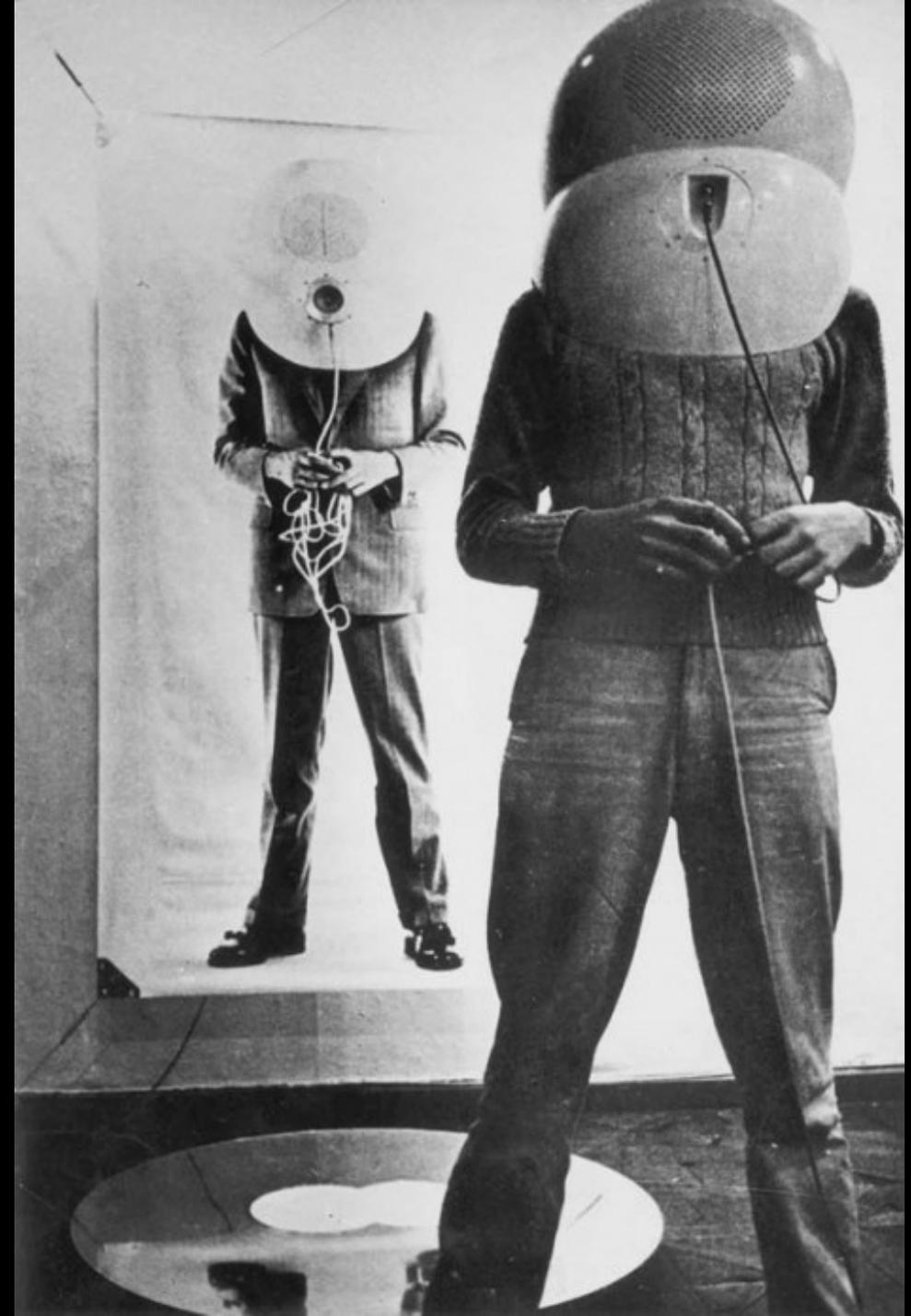
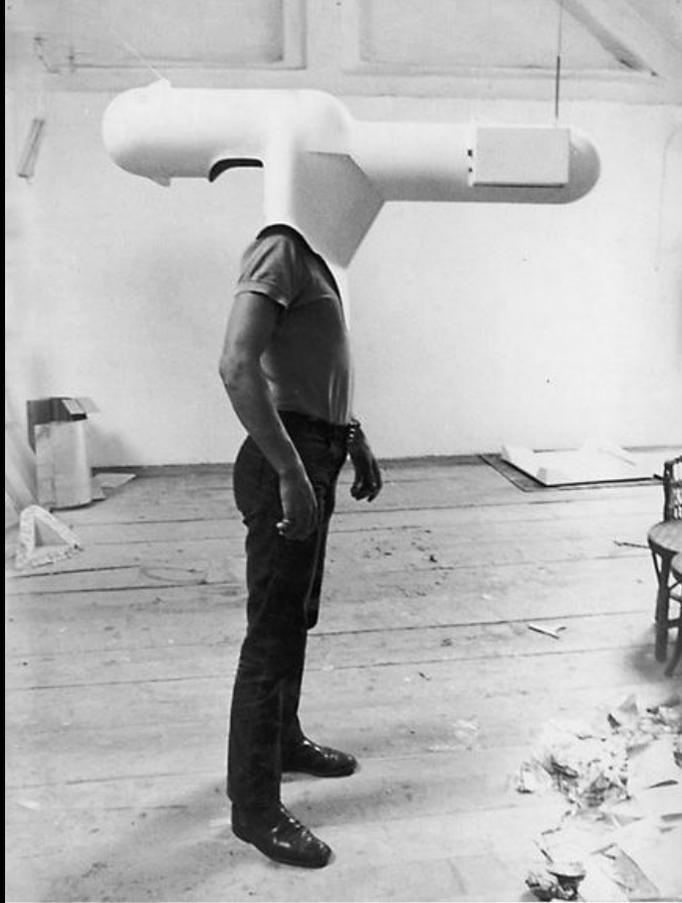
EINSTIEG

STEUERUNG DER
LUFTZUFUHR

AGGREGAT







Left: Walter Pichler, TV Helmet (Portable Living Room), 1967

Right: Walter Pichler, TV Helmet, 1967

Walter Pichler (1936-2012) was an Austrian sculptor, artist, architect and designer

TV Helmet created in 1967 is a technical device that isolates the user while embedding him or her in an endless web of information: closed off against the outside world, the wearer was completely focused on the screen before his eyes.



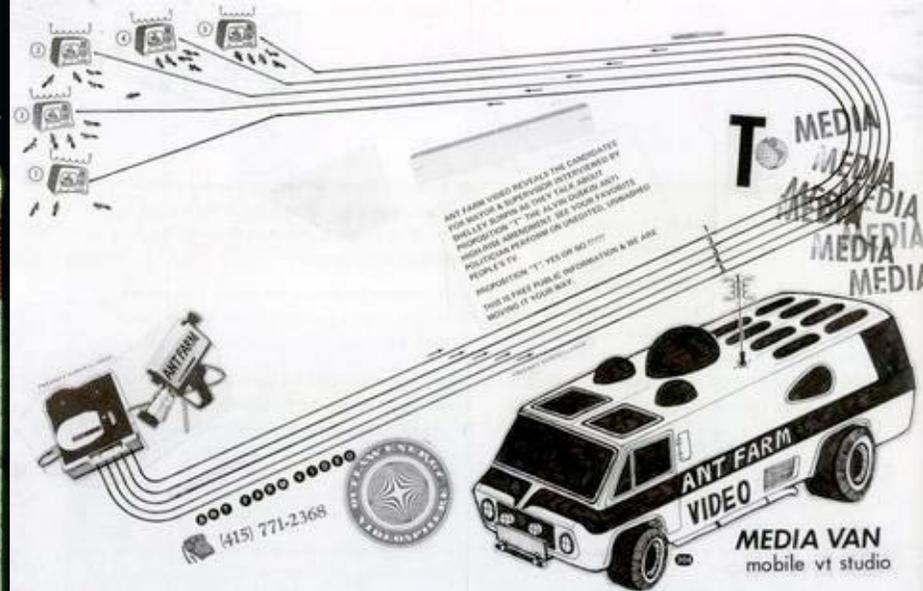
Clean Air Pod, 1970, performance at lower Sproul Plaza, University of California, Berkeley

Ant Farm [1968-1978] = Chip Lord, Hudson Marquez, and Doug Michels



Ant Farm, Inflatables – Clean
Air Pod, 1970-1971

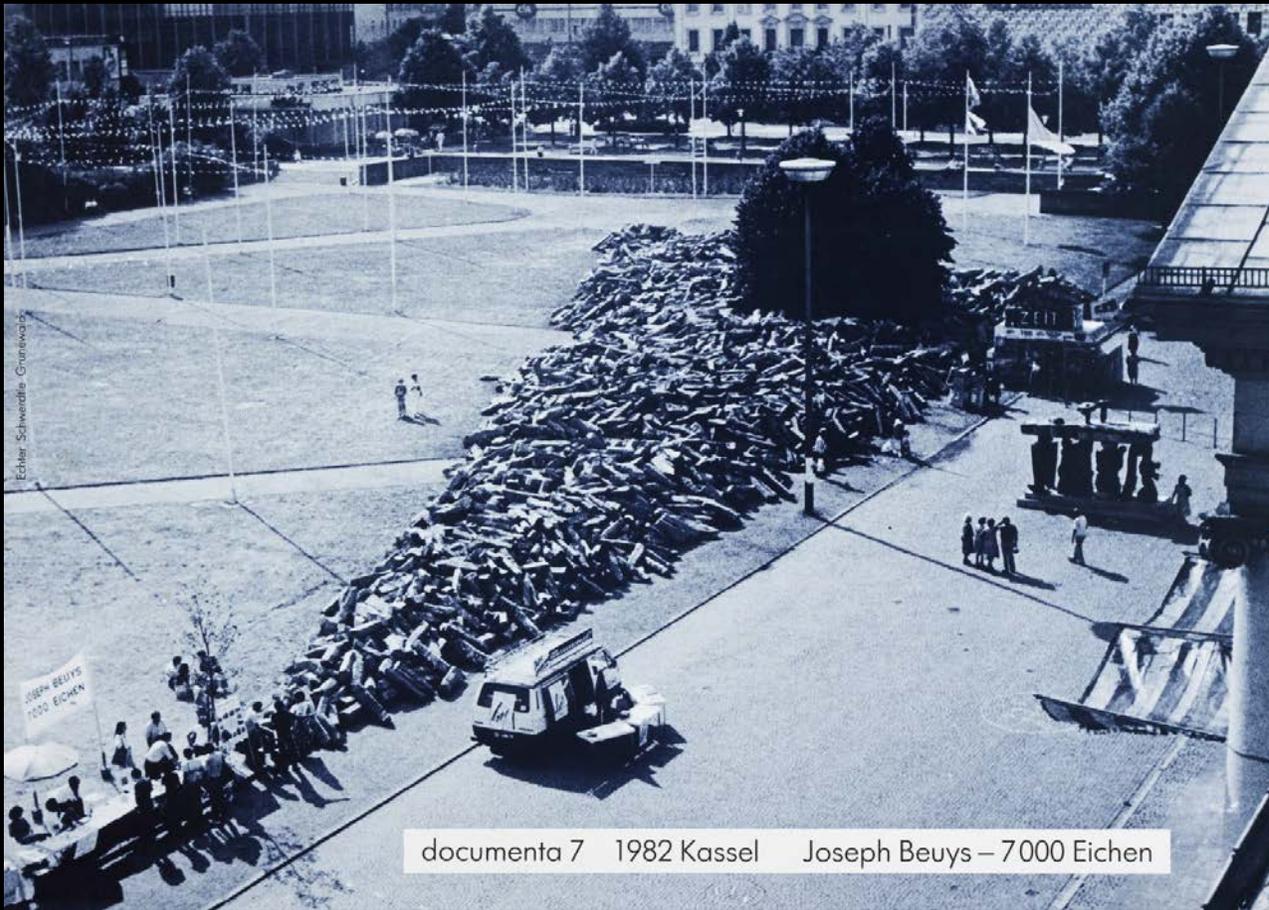




Ant Farm, Media Van, 1970-72/rehabilitated 2008

Ant Farm drove around the country conducting happenings, teaching people how to make pneumatic architecture, and making videos – all from the Media Van.





documenta 7 1982 Kassel Joseph Beuys – 7000 Eichen



Joseph Beuys, 7000 Oaks, 1982

CRISPR-Cas9

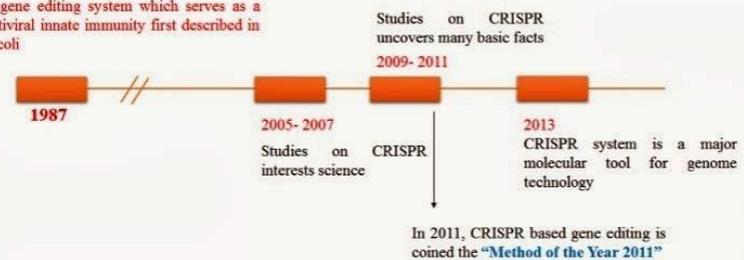


Summary of CRISPR Cas System

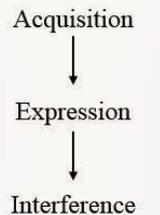
CRISPR type	Dependence on PAM	Signature Cas	Functionality
1	Yes	Cas 3	Cleave and degrade DNA
2	Yes	Cas 9	Cleave DNA
3	No	Cas 10	Cleave DNA (Subtype III A) or RNA (Subtype IIIB)

CRISPR Timeline

A gene editing system which serves as a antiviral innate immunity first described in E coli



Steps in CRISPR Cas functioning

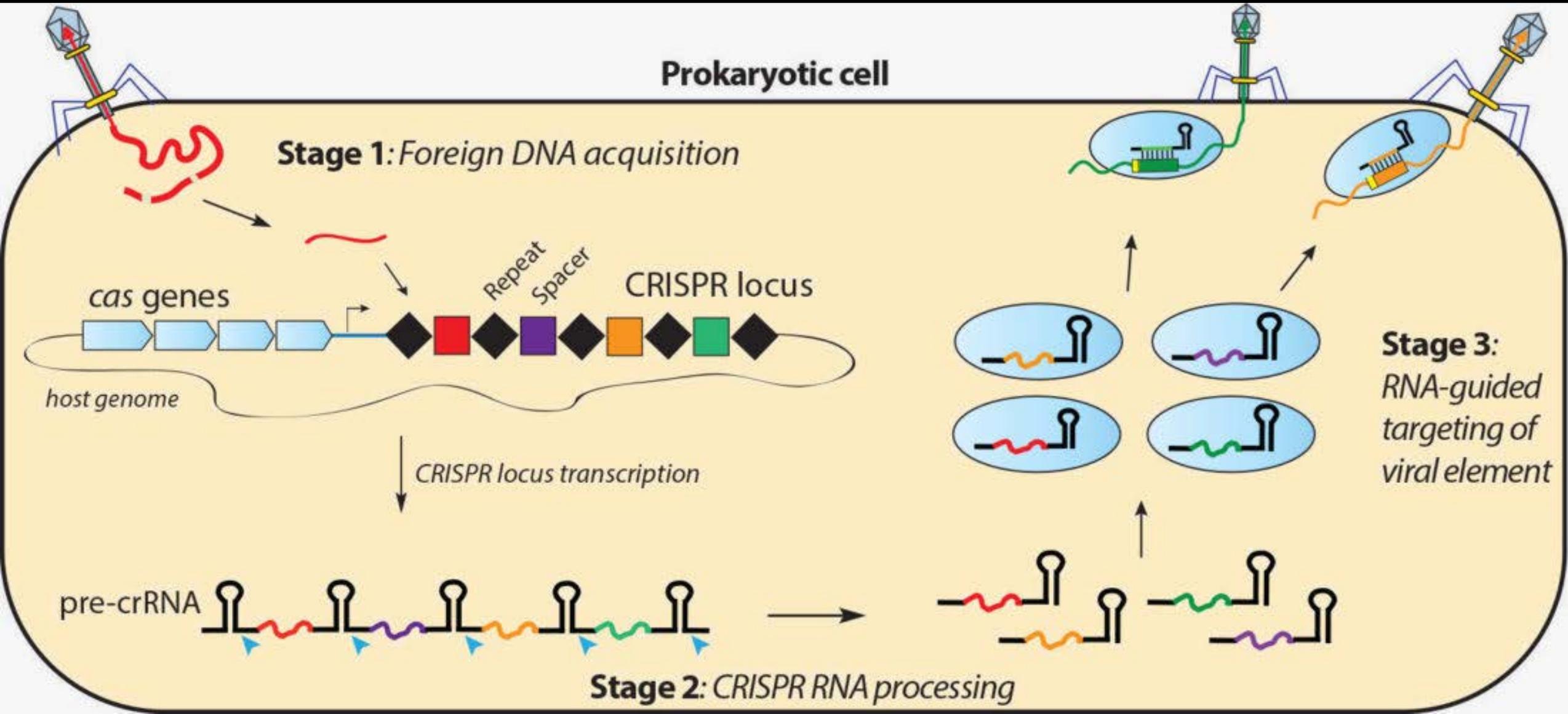


© Varun C N
Microboids

- CRISPR- Clustered Regularly Interspaced Short Palindromic Repeats
- Cas- CRISPR associated
- Based on the structure, activity and mechanism of functioning, it is classified into 3 types and several subtypes.

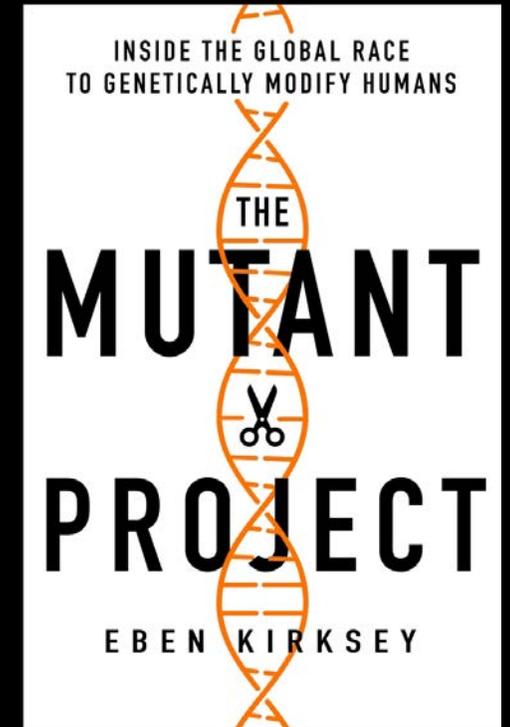
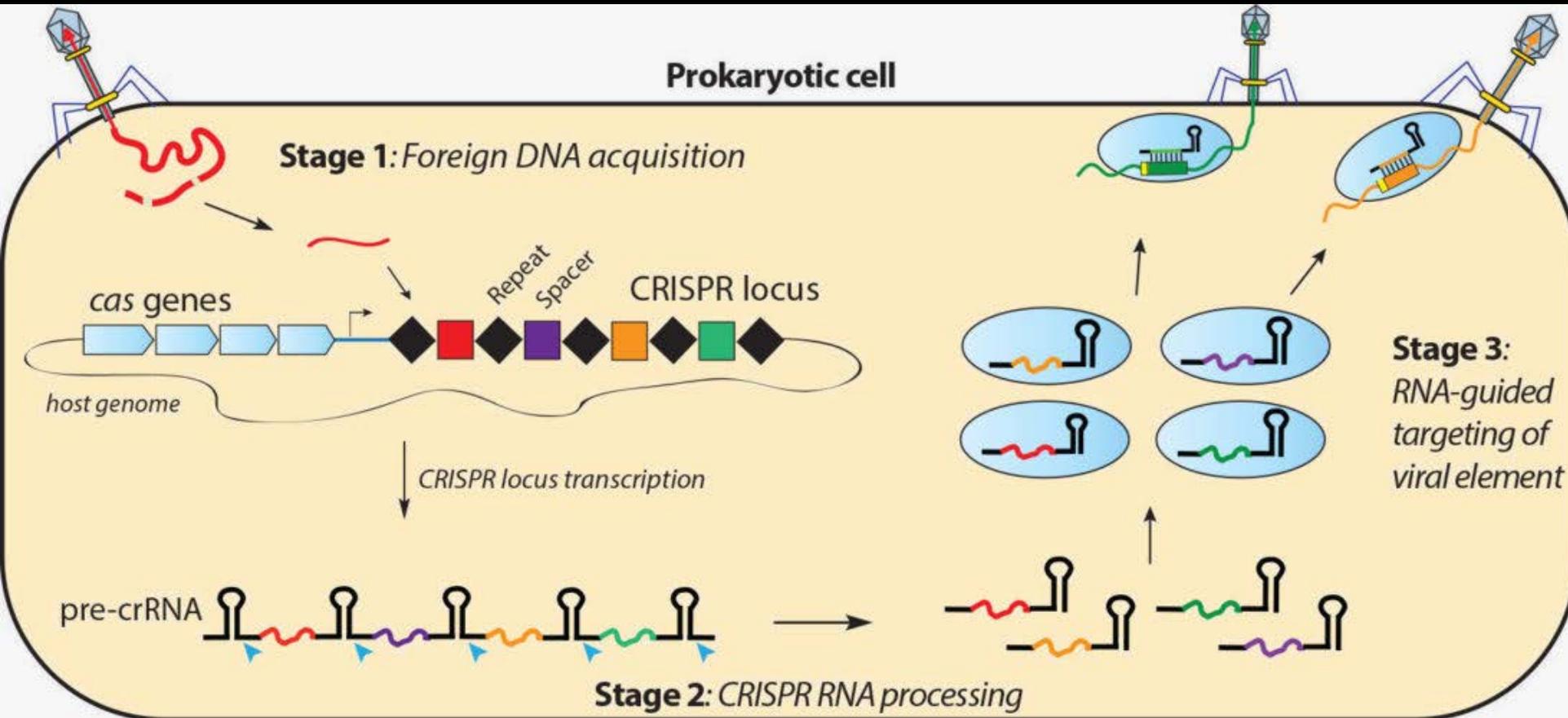
CRISPR-Cas9

<https://www.youtube.com/watch?v=avM1Yg5oEu0>



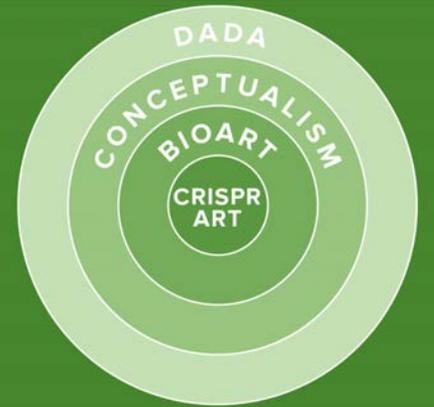
CRISPR-Cas9

<https://www.youtube.com/watch?v=avM1Yg5oEu0>



CRISPR

ART





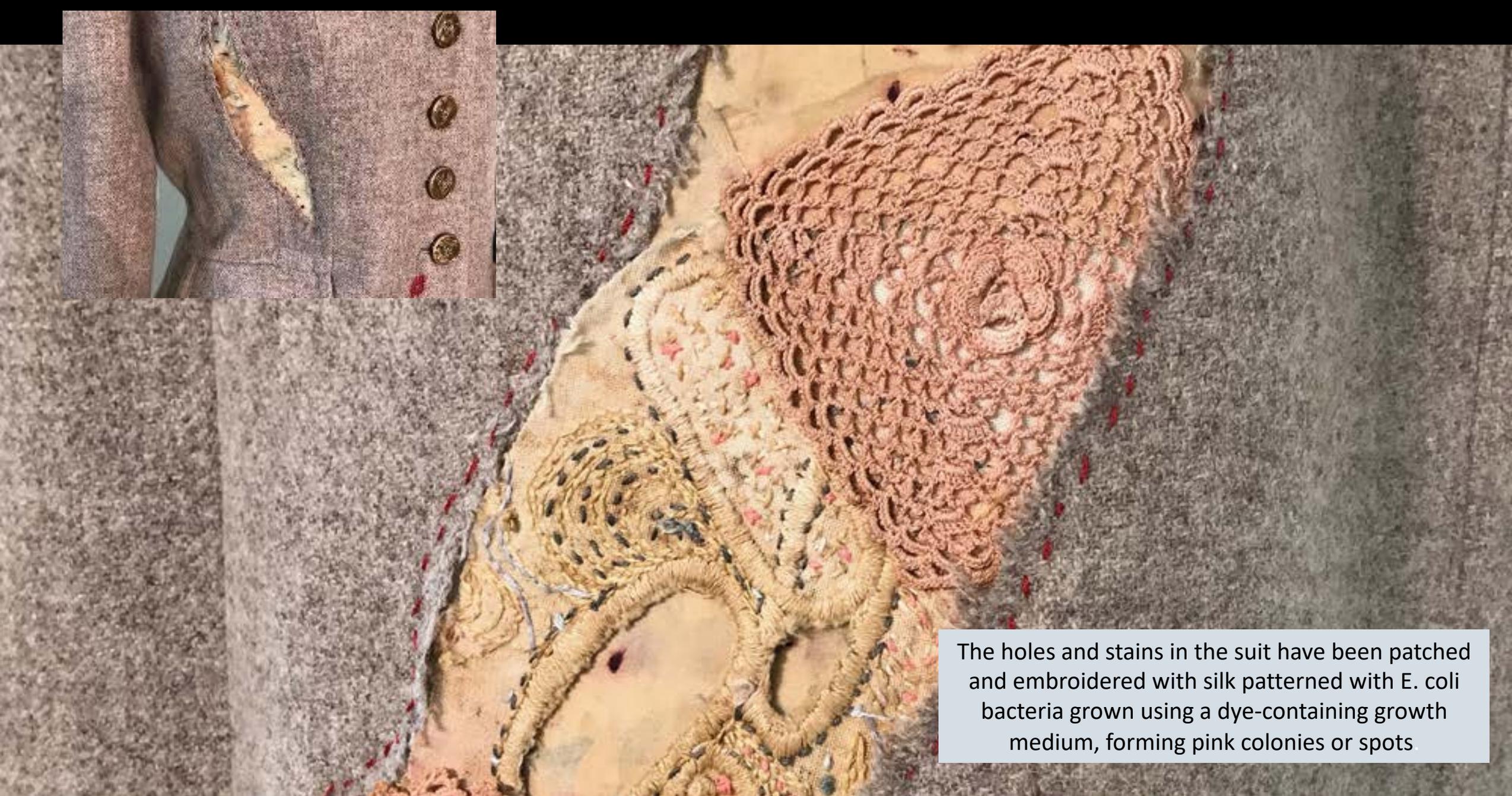
Anna Dumitriu, Make Do and Mend, 2017



Anna Dumitriu, Make Do and Mend, 2017
A patchwork of fabric sewn by hand and
dyed using bacteria manipulated by CRISPR
and then autoclaved



Anna Dumitriu made the installation, "Make Do and Mend," as part of The FEAT (Future Emerging Art and Technology) residency program



The holes and stains in the suit have been patched and embroidered with silk patterned with E. coli bacteria grown using a dye-containing growth medium, forming pink colonies or spots

The genomes of these E. coli bacteria have been edited using CRISPR to remove an ampicillin antibiotic resistance gene and repaired using a technique called homologous recombination to scarlessly patch the break with a fragment of DNA (converted into ASCII code and then to base 4) encoding the WWII slogan “Make Do and Mend”, which encouraged housewives to repair their clothes during the wartime rationing period.



Detail of patched and stained fabric

