Empowering Social Science Research with Industry Partnerships

Gary King[1]

Institute for Quantitative Social Science
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Dean's Symposium on Social Science Innovations, Harvard, 5/3/2021

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Science Magazine, 1995

■ VIEWPOINT: THE FUTURE

Through the Glass Lightly

A collection of scientists at the frontier were asked what they see in the future for science.*
Here are their views....

> If you can look into the seeds of time,
> And say which grain will grow and which will not,
> Speak then to me, who neither beg nor fear
> Your favors nor your hate.
>
> Shakespeare, *Macbeth*, 1.3.58–61

THERE WILL BE ENORMOUS INROADS INTO human biology and human disease via genomics, gene therapy, and mouse knock-out models; a revolution in drug design by combinatorial chemistry; an understanding of the specificity of nerve connections and cognition; and the basic logic of development will be solved (if it is not solved already). New technologies will be developed for studying the structure, function, and dynamics of multiprotein ensembles—for example, the eukaryotic transcription complexes. New methodologies will be developed for studying the behavior of single, live cells in isolation or in the context of an embryo. This includes studying the activity of the cell itself as well as various subcellular structures.

Hal Weintraub
Fred Hutchinson Cancer Research Center
Seattle, Washington

■

BY THE YEAR 2000 OR SO, THE COMPLETE

individuals at risk for diabetes, schizophrenia, obesity, and many other diseases. In many cases, disease will be either avoidable by modification of behavior or ameliorated by therapeutic intervention. For societies with socialized health care programs, the economic cost of screening will need to be balanced by the overall savings in disease reduction. If individuals refuse preventive treatment, screening is not cost-effective. For societies with private health care systems, the rich will become healthier and the poor sicker. In both systems, balancing the rights of individuals against the needs of society is going to be difficult.

Peter N. Goodfellow
Department of Genetics
University of Cambridge

BY USING TECHNIQUES INVOLVING IN VITRO fertilization, it is already possible to remove one cell from the developing embryo and

toxins, sunlight, and so forth. The output will be a color movie in which the embryo develops into a fetus, is born, and then grows into an adult, explicitly depicting body size and shape and hair, skin, and eye color. Eventually the DNA sequence base will be expanded to cover genes important for traits such as speech and musical ability; the mother will be able to hear the embryo—as an adult— speak or sing.

Harvey F. Lodish
Whitehead Institute for
Biomedical Research
Cambridge, Massachusetts

THE OLD PHRASE "YOU can't get blood from a turnip" may be proven incorrect, at least partially. Transgenic plants hold promise as biomanufacturing systems for a wide variety of human proteins, including those found in blood plasma. Serum albumin, for instance, has been shown to be expressed and processed correctly when the gene encoding it was introduced into plants. The missing element in this scenario is process technology, which will make it possible to do large-scale protein purification from plant tissues. Advances in high-level protein expression in specialized plant tissues (such as seeds, fruits, or tubers) coupled to engineering improvements in protein isolation may make this technology feasible in the coming decade.

Charles J. Arntzen
Institute of Biosciences and Technology

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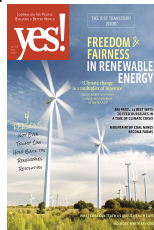 - Scientists:

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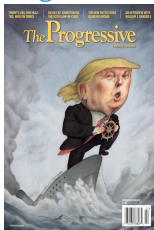   - Scientists: total control over what's published & when

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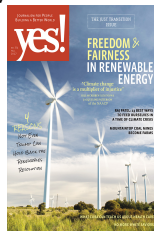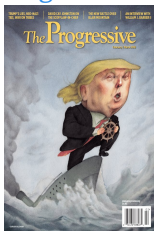- Goal: to randomize, respecting constraints
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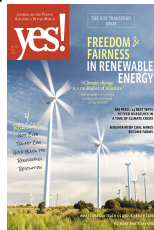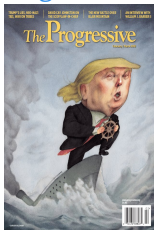
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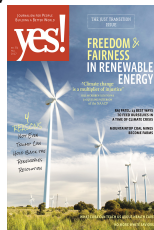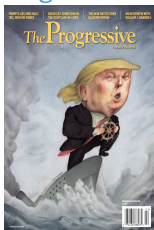
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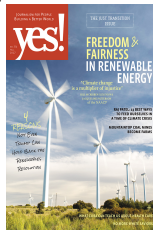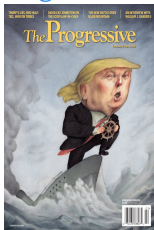- Results:

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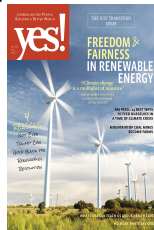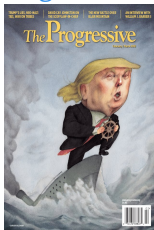
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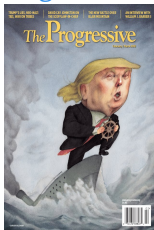
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  - OpenDP initiative, hundreds joining global effort

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For more information
GaryKing.org