Academy of Sciences of the USSR, the Academy of Agricultural Sciences, and the Academy of Medicine. More serious still, geneticists, cytologists, and evolutionists as eminent in their fields and as well known to their colleagues all over the world as Dubinin, Schmalhausen, Zavadovsky, and others have been removed from their positions, deprived of their laboratories, or led to make shameful declarations of their supposed acceptance of Lysenko's view. Finally, the temper of this supposedly scientific controversy may be appreciated by the pronouncements of S. Kaftanov, Minister of Higher Education, to the effect that all anti-Lysenko doctrine must be systematically rooted out of the schools, universities, research institutes, and publishing houses.

It may be left to the judgment of scientists, friends of science, and all fair-minded people to arrive at their own conclusions regarding the propriety of governments and political parties not only deciding a supposedly scientific controversy in favor of one and against another theory, but also dismissing scientists and depriving them of the means of conducting their research, and too often of their lives, because of their adherence to a scientific theory accepted everywhere on this side of the iron curtain. As representatives of American scientific societies devoted to furtherance of research and study in genetics, we feel it our duty to state that the contention raised by Lysenko and his "Michurinists" against genetics does not represent a controversy of two opposing schools of scientific thought. It is in reality a conflict between politics and science. Today the condemned science happens to be genetics. Indeed, the conflict has already spread to other biological fields, and eminent physiologists, embryologists, microbiologists, and others are now being dismissed in the USSR. Tomorrow still other sciences may be proscribed.

The progress of science has always depended upon free inquiry. The inheritance of acquired characteristics, and other doctrines that the Russians now set forth as the official party line, have had their proponents in America; some nongeneticists still hold to these ancient opinions. Nevertheless, they are allowed to investigate or philosophize, and they have a hearing. In Russia, on the other hand, geneticists are being rooted out as dangerous, bourgeois, reactionary, idealist, fascist, regardless of their political views, simply because they, like geneticists everywhere else in the world, know and accept the facts of experimental breeding and microscopic observation which Russian politics has branded false. It is of the utmost importance for the preservation of free inquiry in that part of the world where it still exists that these facts be known and fully appreciated.

The Governing Board of the American Institute of Biological Sciences, an organization representing American societies in numerous fields of biology, is issuing the present statement after consultation with the executive committees of those societies in its organization which deal more particularly with the matters here at issue—namely, the Genetics Society of America and the American Society of Human Genetics. We would sum up our positions in the following propositions:

1. In our opinion the conclusions of Lysenko and his group regarding the inheritance of adaptive responses in higher organisms have no support in scientific fact.

2. Genetic researches definitely support the reality of the gene and the validity of Mendel's laws. They do not support the official Communist claim that Mendelian heredity is an illusion, and any attempts on the part of Russian proponents of the Lysenko doctrines to bolster their case by citations from the works or conclusions of Western scientists are gross distortions of the meaning and intent of these scientists.

3. We condemn the action of the Soviet government in presuming to banish a firmly established science from its schools, publishing houses, and research laboratories, and in persecuting scientists because their field of inquiry is distasteful to the government.

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T. C. Byerly
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Executive Committee

Governing Board
American Institute of Biological Sciences

S. 1703 and the Antivivisectionists

Science will probably lose by default its present legislative battle against one of its most vocal and powerful enemies—the antivivisection cult.

Representatives from twenty-six national health and science groups, local hospitals, universities, lay groups, and governmental agencies met in Washington the second week of July to discuss the political future of Senate Bill 1703, medical science's first Congressional broadside against the antivivisectionists.

Specifically, the bill would enable District of Columbia scientific institutions to utilize a portion of the seven to ten thousand unclaimed and unwanted animals now annually destroyed in the District pound. The experimental use of these dogs which would otherwise be uselessly killed could speed research and teaching in the universities and government agencies of the nation's capital.

The bill applies to the District of Columbia only. Actually, however, because of its precedent-establishing nature, the legislation is of national importance.

A. C. Ivy, secretary-treasurer of the National Society for Medical Research, reported to the Washington meeting that a recent legislative conference revealed the bill would probably remain in committee because scientists and the friends of science have failed to express themselves on the matter. Dr. Ivy pointed out that members of the special Senate subcommittee to which the bill was referred are personally in favor of the bill, but that an organized flood of antivivisectionist mail has introduced political complications.

Senator Margaret Chase Smith of Maine, the chairman of the subcommittee, has received the brunt of the antivivisectionist pressure. Although she recognizes the

great need for the bill's enactment, Senator Smith apparently regards the measure as a political "hot potato" and hopes to avoid political pressure from the small-numbered but extremely militant antivisisectionists by keeping the bill in committee. Senator J. Howard McGrath of Rhode Island, another subcommitee member, who introduced S. 1703, has also been subjected to antivivisectionist political pressure.

Scientists and their friends should write to Senator McGrath supporting S. 1703 and to Senator Smith urging the subcommittee to recommend the bill.

As Dr. Ivy said, "The preposterous and dangerous situation which the antivivisection movement has produced is really the scientist's fault. Our lack of effort in the past has enabled the antivivisectionists to achieve their present restrictions on research and teaching. It would be more than a tragedy if further inertia were to continue and this important legislation suffer a defeat."

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On the Application of Scientific Procedure to the Social Sciences

In a letter published in *Science* (March 18, 1949) Edgar G. Miller, Jr., says "Science is not any particular method or set of techniques. It is a way of reasoning. The standards are intellectual rather than procedural." These statements are part of an argument showing that it is wrong to criticize the social sciences on the ground that they do not use the "procedural" methods of natural science. The writer says further that "the validity of the scientific method is not confined to any one procedure."

I believe this is a misapprehension. Natural scientists have discovered, rather late in history, that science can progress only if it is made impersonal and objective. Observations of facts in nature have to be independent of the observer—of his language, race, religion, intellectual power, and above all his motives. The "procedure" for ensuring this is simply to require that any fact be observable or demonstrable at all times to anyone, before it is admitted as a part of science. Only since enforcement of this procedure has science truly grown; and, conversely, if it were relaxed science would retrogress to the days of alchemy and astrology. This applies to descriptive sciences like geology as well as to laboratory sciences like chemistry. The facts of descriptive science must be demonstrable. Any hypothesis which may be constructed must be labeled as such; it must be held plausible only as it codifies observations, and useful only as it leads to further observations. Until it is rigorously—procedurally—checked, it may not be used in demonstrations, simply because that would be assuming what is to be proved. It is only thus that science can purge itself of errors—especially errors stemming from the desire to prove something preconceived rather than to ascertain the truth.

It does not follow that the intellectual tools of science—hypothesis before the fact, and logic after it—are unimportant. It is just that they are not sufficient. Logic and hypothesis existed long before science made any serious progress. The theologies and philosophical schools that flourished in the predemonstration days were the work of men whose intellect and imagination were as good as our own. Their hypotheses were brilliant, their logic profound and subtle. Their common defect was simply that they did not check their premises by observation. The consequence was that their systems of thought were generally of low usefulness as descriptions of nature or as bases for scientific advance. The writings of Aristotle furnish plenty of classical examples in illustration. What is proved by thinking depends on the premises, and if the premises are arbitrary or unrelated to nature the conclusions will be the same. Such pursuits as chess playing and theology have intellectual standards as exacting as those of natural science, but they are not science, because they have nothing to do with nature, and may exist purely in the mind. It was not until thinkers applied the criterion—procedure—of checking their teachings one by one against observation, and excluding from science anything that could not be so checked, that the success and prestige of present-day science could begin to grow.

All this does not mean that further effort in the social sciences is useless unless they confine themselves to the observational method. In history, for example, it is impossible to use the critical procedure of physics or chemistry. That does not prove that history is not a useful or rewarding study; a thorough knowledge of history on the part of today's citizens might benefit humanity more than the know-how of rockets and atom bombs. It does prove that history is not a natural science, and that a prediction of future events, or even a recital of past ones, is and remains an opinion judicially based on limited evidence, instead of an objective fact to be built on with confidence. The modern social sciences are in a somewhat different position; many of their teachings are objective and demonstrable. But many others are not, and perhaps never will be; and failure to differentiate between fact and hypothesis can serve only to debase future work in the field. The consensus of scientific thought will be, I think, that social science may best advance by checking as many of its teachings as possible against experiment and observation, and rigidly separating these from the teachings that are as yet unconfirmed by critical procedure and are therefore still hypotheses or assumptions—to be regarded as *useful* instead of *true*, and above all to be treated with the impersonal skepticism of the scientist instead of the interested faith of the prophet.

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