

tions with other environmental factors; or in the case of noise, light, heat, etc., pertinent descriptions should be included. Be as specific as possible here. Each substance or kind of pollution should be related to a particular species and kind of effects under investigation. As much of the foregoing material as is applicable should be supplied for epidemiological studies.

2. *Transport, distribution, and degradation.*—The whole array of physical, chemical, and biological processes involved in movement of pollutants in the environment is of concern. Aside from the obvious distribution of pollutants poured into our waterways, or air pollutants released into the atmosphere by combustion, other substances are included. For example, pesticides which are applied to farm fields may move to the atmosphere as vapor, or as solids or liquids attached to airborne particles; or may be washed into water courses; or may be picked up and incorporated into the plant and animal tissues and transported with these. Thus, studies of atmospheric circulation, the hydrologic cycle, migratory patterns of birds or fishes, and marketing patterns of agricultural produce may all contribute directly to understanding this problem. The locus, rates, and kinds of changes that take place in the pollutants also are of concern, and studies on atmospheric chemistry and metabolic alteration are included here.

3. *Measurement and instrumentation.*—Studies devoted to the detection, identification, and quantification of pollutants or effects of pollutants are included here. Because such measurements are so closely related to instrumentation, instrument development is also included.

4. *Exposure to and sources of pollution.*—The exposure to the same pollutant from various sources (e.g., lead in air, water, and food) and the relative contribution of different sources of the same pollutant or pollution is the central issue here. For example, carbon dioxide may come from volcanos, forest fires, respiration, power generation, and a whole host of other sources of combustion; the hydrocarbons in the atmosphere come from volatiles produced from growing trees, from combustion in motor vehicles, from combustion (and lack of combustion) in jet aircraft and diesel engines, etc.

5. *Social, economic, and legal aspects of pollution.*—Attitudes, likes and dislikes, political organization related to control, etc.

6. *Control of pollution.*—Control of pollution or, more properly, management of pollution may include prevention through use of a non-polluting technology; removal of pollutants that are formed before they enter the environment; or treatment of some part of the environment to remove the pollutant. Research here will grade into development and on into demonstration where the intent is to gradually move a laboratory discovery into a practical operating system or device which the public or some segment of it can be convinced to use.

APPENDIX 4 (TO TESTIMONY OF DR. JOHN L. BUCKLEY)
FEDERAL SUPPORT FOR FISCAL YEAR 1967 ON POLLUTION—AIR, SOIL, AND WATER

Agency	Extramural			Intramural		
	With funds	Without funds	Funds	With funds	Without funds	Funds
USDA.....	8	76	\$104,818	36	-----	-----
AEC.....	34	3	1,244,174	12	-----	-----
Commerce.....	2	3	111,100	35	1	\$2,694,940
DOD.....	19	11	625,000	15	13	340,000
HEW.....	213	1	8,680,905	12	2	434,550
HUD.....	1	1	26,650	-----	-----	-----
Interior.....	396	41	10,248,551	61	87	2,872,852
NASA.....	8	2	1,136,000	1	-----	123,000
NSF.....	17	-----	662,200	-----	-----	-----
TVA.....	-----	1	-----	-----	13	-----
VA.....	-----	-----	-----	-----	11	-----
Total.....	698	139	22,839,398	124	175	6,465,342

Note: The statistics in this table represent only those research grants and contracts registered with the Science Information Exchange by Federal granting agencies.