lection for irregularity very weak and perhaps nonexistent should be pointed out.

First, only in that portion of the population using rhythm would there be any selection at all and only in the female half of that population. Also, time of ovulation is probably a polygenic trait and the phenotype which we are examining rather distant from primary gene action and thus highly susceptible to environmental factors. These conditions would slow down selection. Nonetheless, use of the rhythm method would increase the selective value of the genes that cause irregular cycles.

On the other hand, selection factors exist which have been operating through evolution to give us a reasonably regular cycle in present-day women. These factors, however strong or weak they may be, should continue to operate in the population and perhaps cancel out entirely the selection caused by the use of rhythm. (It is interesting, and in a sense amusing, to note that the use of rhythm now, with its possible selection against regularity, may be several thousand years too soon. Perhaps we were evolving toward perfect regularity when natural methods of conception control would have been foolproof!)

Further, one may even postulate that selection for regular ovulatory cycles may increase as the use of rhythm grows. For example, that portion of the male population who are ready to practice rhythm are intelligent, responsible and self-sacrificing people, otherwise they would not attempt such a method. It seems reasonable (at least as reasonable as many of Hardin's conjectures) that they might in the future practice a rather rigid selective influence by choosing as mates only those women who have regular cycles. Thus selection may soon turn in favor of regular ovulatory cycles and the natural method of conception control become even more effective.

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Scientists and Civil Defense

I hope that scientists do not heed D. S. Greenberg's advice, on other matters so sound, that scientists transfer their attention from "bomb" problems to such home problems as traffic control (27 Dec. 1963, p. 1635). . . . Certainly their efforts and influence are needed to supplement the efforts of the Arms Control and Disarmament Agency, and civil defense is even more critical because it is the primary concern of no agency.

I also take issue with Greenberg's implication that the verdict of informed, thinking men is against civil defense. I don't believe that any scientific group has rocked or "could rock the U.S. government with a well-drawn and well-publicized brief against civil defense." And it was *not* "against its better judgment" that Congress granted an early Kennedy request for civil defense expansion (6 Dec. 1963, p. 1277). Contrary evidence is in the recent civil defense hearings before the Hebert subcommittee of the House (*1*). In these open hearings, 88 witnesses testified in favor of the bill for incorporating fallout protection into new public buildings, and 15 against. Of the 30 with claim to some scientific competence, including scientists, engineers, M.D.'s, and architects, 25 were for and 5 against the bill. However, as I interpret the testimony, only one, a psychiatrist, was against civil defense, his grounds being the possible psychic damage to children from civil defense preparations. The other four were against the bill because it was not strong enough, their general contention being that an effective civil defense must also afford protection from fire, blast, chemical, and biological hazards—comprehensive protection of the type which Russia and Sweden, according to other testimony, have already supplied to an important fraction of their populations. . . . the subcommittee, and then the House, by wide margins, voted for this bill authorizing all of the little the Department of Defense had asked for. If the Senate informs itself as well as did the House, it should follow suit.

Of course the remaining question is how far we should go beyond this rudimentary step, involving 0.5 percent of our defense budget, toward the ultimate of comprehensive protection, involving up to 10 percent of our defense budget for 5 to 10 years (*2*). Unfortunately, the Department of Defense may not supply a good answer to this question despite the competence of its OCD, if its thinking is reflected in the statement by General LeMay, Chief of Staff of the Air Force, that the expenditure for comprehensive protection "would be unwise, ill advised, and more importantly, would inevitably become competitive with requirements for active defense." Assistant Secretary Pittman candidly stated, at the more recent Senate hearings, that the program of the bill "has the support of the military services because it has been carefully designed as a modest and manageable undertaking. If it threatened to grow into a vast and expensive system, it would not have the support of the Secretary of Defense and the Joint Chiefs which it has today" (*3*).

We cannot leave to the military alone the development of policies on which, should war come, hinge the fate of each civilian and each segment of civilian society and culture. . . .

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2. T. R. Martin, Jr., and D. C. Latham, *Strategy for Survival* (Univ. of Arizona Press, Tucson, 1963), pp. 261–293; H. A. Sawyer, Jr., *Civil Engineering* **29**, 868 (1959).
3. S. L. Pittman, *Information Bulletin, Department of Defense, Office of Civil Defense, No. 93*, p. 12 (1963).

Cigarettes and Polonium-210

Our report dealing with polonium in cigarette smoke (*Science*, 17 Jan., p. 247) was necessarily brief, and it is evident from Irving Michelson's letter (28 Feb., p. 917) that some aspects of our observations were not clear. With respect to the relative importance of polonium in genesis of lung cancer, we have emphasized that the anticipated low radiation dose would act primarily as a cancer *initiator*. The known chemical carcinogens are apparently not present in sufficient amounts in smoke to account for lung cancer rates ascribed to cigarette smoking. Although ionizing radiation is an initiator par excellence, only time will tell the importance of polonium's alpha radiation among the possible initiators of bronchial cancer in smoking. As we pointed out, the cocarcinogens in cigarette smoke probably are important also as causal factors. In addition, radiation from this source could act in association with viruses.

We believe our estimates of local radiation doses to certain regions of the bronchial epithelium are low principally because of variations within the samples of bronchial epithelium we