Letters to the Editor

A Plea for Stabilized Progress

Government inevitably reflects the mind of Main Street. Among the laymen, and therefore in government circles, the practical aspects of atomic fission appear to have produced four characteristic, if not correlative, reactions: (1) a vague, yet realistic, fear; (2) concomitant or subsequent attempts to escape from reality by clinging to national and local tradition; (3) a consuming interest in the mechanics and destructive potentialities of the bomb; and (4) futile gestures toward keeping secret the methods of manufacture and design.

There is considerable likelihood that these elements of reaction may combine to swing the pendulum of science from obscurity to sustained and revered leadership. Scientists may be lavished with all the respect and eulogy previously accorded generals. It is pertinent, therefore, that we be prepared to advise the public politically before the first limelight fades. Profs. Einstein, Urey, and others have already indicated the dire necessity for world government as the only plausible defense against the atomic bomb. But how to implement a solution of the social and organizational problems involved? We vaguely and categorically satisfy ourselves with the ends and leave the means to "society," "politics," or other social abstraction.

Our logical co-worker in this regard is the social scientist, for his background consists of the history of human relationship and a knowledge of present social conditions and trends. His equipment for dealing with outworn and positively dangerous traditional thinking should be ideal. Perhaps he can shed light on the problems necessarily accompanying, and peculiar to, the establishment of permanent peace.

Raymond E. Bassett (*Science*, 1946, 103, 25–26) confirms the similarity of method inherent in sociological, and in physical, biological, and medical investigations. Mutual cooperation, therefore, could be maintained on a common footing to the ultimate satisfaction of both groups, and a coordinated solution to world problems might be effected.

In order that science may proceed on a comprehensive and safe basis, it seems not unreasonable to suggest for the two scientific groups a 50–50 relationship. This would involve an equal sharing of government appropriations, a more equitable distribution of offices within the more broadly constructed scientific societies and organizations, and unremitting requests to the public and Government for impartial support of scientific projects, regardless of social or physical classification.

Unfortunately, with the rapid and not always well-deliberated shifting of public opinion, physical science may become a disproportionate public fad, and the social scientist may be lost in the shuffle.

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Broadcasting Congressional Sessions

A continuous radio broadcast of all open Congressional proceedings would do more than almost anything else to intelligently arouse, enlighten, and interest the American people in the preservation of the American way of life.

We have the technical power to place a microphone at every congressman's desk and provide a place on our radio bands for democracy in action at its roots. The cost involved would be trivial compared to the value to our country.

If those men of science who approve of this plan would approach their governmental representatives and radio executives and interest their friends in doing likewise, considerable influence would be directed towards the attainment of a continuous radio broadcast of all Congressional sessions.

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Federal Aid for Scientific Research

The importance of federal aid for scientific research is again stressed by publication in the *New York Times* (14 February) of a "top secret" letter from German Grand Admiral Karl Doenitz admitting, in the fall of 1943, that American and British scientists had defeated the U-boat campaign through "superiority in the field of science." He said: "It is essential to our victory that we make good our scientific disparity and thereby restore to the U-boat its fighting qualities."

While scientists are practically unanimous in favoring federal aid for research, many are apt to be misled by idealistic declarations in the preambles of proposed legislation or in the statements of Committees, and thereupon assume that whatever the bill itself proposes, or the small executive group of the Committee decides upon, will really be helpful in attaining the ideals advocated. While nominally having the right of criticism, many, if not most, of these well-meaning persons fail to consider in detail what is actually expressed or implied in a bill, and may thus find themselves used as "rubber-stamp" sponsors for practical results which, on sober reflection, they would abhor.

After securing a copy of the bill S. 1720 and making a careful analysis of it, I read (*Science*, 1946, 103, 161) that S. 1720 is undergoing final redrafting; so that perhaps my comment may be moot. But I cannot take the naive view (expressed in *Science*, 1946, 103, 104) that techniques of administration are unimportant. As I understand it, S. 1720 places very great power and financial patronage in the hands of appointees and appointees of appointees. Even though Sec. 4 (f) of S. 1720 says that all "officers and employees of the Foundation, shall be chosen without regard to their political affiliations

and solely on the basis of their demonstrated capacity to carry out the purposes of the Foundation and their fitness to perform the duties of their office,'' even scientists should know enough of practical politics to realize that those making appointments can always find ''fit'' persons among the ''deserving'' of their political views. The fine objectives of this movement for federal aid to science might easily be perverted or even blocked should the control of the funds or their administration get into the hands of the wrong persons. Selection of key personnel by nonpolitical scientific groups is a wise and even essential safeguard. The Federal government already has many thousands of scientists in its employ—about 40,000 according to the last estimate I saw.

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In Support of a September Meeting of the AAAS

We wish to add our support to the suggestion made by Prof. R. S. McEwen (*Science,* 1946, 103, 178) that the AAAS meetings be held at a season other than the Christmas holidays. As Prof. McEwen says, attendance at winter meetings is usually made disagreeable by bad weather, crowded trains, colds, and disrupted family gatherings. Furthermore, there is no reason why biologists should have to spend their short winter vacation attending scientific meetings, while chemists, physicists, and various other professional groups schedule and attend their meetings with little regard for college teaching schedules. On the whole, it seems that early September might be the best time for a meeting. An objection might be raised by some biologists who work up the results of their summer's research during the autumn and present them at the winter meetings, but this objection is minor and could usually be overcome. Let us give serious consideration to Prof. McEwen's suggestion and try another September meeting.

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Radio Echoes From the Planets

The recent announcement of the reception of radar echoes from the moon have aroused interest in, and raised inquiries concerning, the absorption of microwaves by those gases which are present in the atmospheres of the various planets. A general investigation into the microwave absorption has been made at these Laboratories and some results presented before the New York section of the American Physical Society (*Phys. Rev.,* 1945, 68, 284). It was found that of the 50-odd substances which are gases at room temperature and pressure, 15 strongly absorb microwaves. Absorption may be characterized as either resonant or nonresonant. In methyl fluoride the absorption is largely nonresonant. At a wave length of 1.0 cm. this gas at normal temperature and pressure will reduce the power in a plane wave by 50 per cent for each 23 feet of gas traversed by the wave. At 3.0 cm. the absorption is 75 per cent as large as it is at 1.0 cm. Ammonia, on the contrary, exhibits resonant absorption, with the maximum in the curve under the above conditions occurring at 1.25 cm. while at 3.0 cm. absorption falls to 20 per cent of its maximum value. This gas is found in the atmospheres of both Jupiter and Saturn. It might be thought that considerable information would be given by varying the frequency of the radar transmission, but this is not the case. Owing to the high gas pressures found on these planets and the presence of other nonabsorbing constituents in their atmospheres, the width of this absorption region is so great that it is likely that both microwaves and waves in the ultra short radio spectrum will be totally absorbed in the atmospheres surrounding these planets. The transmission paths involved in radar sounding are so great that a very small absorption coefficient will give rise to total extinction. The results of further radar experiments should prove of value in increasing our knowledge of the constitution of planetary atmospheres.

For the information of those who are interested, the list of gases showing large absorption for microwaves includes the methyl and ethyl halides, the gases known commercially as Freon, three of the amines, ammonia, and sulphur dioxide. In fact, all nonplanar molecules having a dipole moment which have been tested thus far in the Laboratory show strong absorption in the microwave region, and in general this absorption is of the nonresonant variety.

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Competition Between Two Entomogenous Bacteria

The antibiotic activity of *Bacillus larvae,* the causal organism of American foul brood of the honeybee, was recently reported by E. C. Holst (*Science,* 1945, 102, 593–594). A phenomenon suggesting antibiotic activity is to be found in two other entomogenous bacteria, *Bacillus popilliae* Dutky and *Bacillus lentimorbus* Dutky, the causal organisms of two types of milky disease of Japanese beetle larvae. The vegetative forms of these two bacteria are similar in appearance, but the spore forms are readily distinguishable. The bacteriemic infection of the host is very similar in the two cases. Neither bacterium has been cultured artificially with any degree of success.

Both types of milky disease, described by S. R. Dutky (*J. agric. Res.,* 1940, 61, 57–68) and designated by him as Type A (*B. popilliae*) and Type B (*B. lentimorbus*), can be individually induced in host larvae by injection into the body cavity of adequate numbers of the respective bacterial spores. Both types of bacterial parasitism, however, do not occur in the same host individual. If a mixture of *B. popilliae* and *B. lentimorbus* spores is injected into a host larva, only Type A or Type B develops —not both. The relative spore dosage largely determines which type is successful. In most cases, Type A