Preliminary experiments showed that amniotic fluid alone would not clot oxalated plasma; therefore it does not act like thrombin or trypsin, which clot oxalated plasma without added calcium. Amniotic fluid contains no prothrombin, since a clot will not form in prothrombin-free, oxalated plasma on the addition of calcium, thromboplastin, and amniotic fluid. Amniotic fluid does not decrease the plasma prothrombin time in the one-stage method.

TABLE 3

CLOTTING TIME

Specimen	Hemophilic blood	With 0.1 cc amniotic fluid
	min.	*min.*
A2-24	54	4
A2-25B	54	3.8
A3- 1G	54	3.5
A3- 2W	54	3.9

Amniotic fluid has a marked antihemophilic action *in vitro*. Table 3 shows the effect of .1 cc of amniotic fluid on the clotting time of a hemophiliac who was resistant to therapy with Fraction 1 and fresh frozen plasma. It can be seen that the amniotic fluids produced clotting times with hemophilic blood comparable to those they gave with normal blood, whereas the hemophilic control tubes clotted in 54 min.

It would appear that amniotic fluid acts like thromboplastin in its effect on oxalated plasma. This activity is preserved for several days by storage in the deep freeze at $-10°$ C but deteriorates within 1–3 days on standing at room temperature or in the ice box. The activity is nondialyzable. Boiling strongly for 5 min destroys it, although it is stable at 60° C for 30 min. Furthermore, it is entirely inactivated by small amounts of heparin. Various incubation tests which were done with amniotic fluid and fibrinogen clot or plasma clot showed no evidence of fibrinolytic power in amniotic fluid. Clotting tests of amniotic fluid with fibrinogen solution verify the lack of thrombic or prothrombic activity.

Uncontaminated amniotic fluid collected during labor contains a coagulant. This coagulant is thromboplastic in its behavior and antihemophilic. It is possible that amniotic fluid initiates clotting of shed intra-uterine blood and therefore plays an important part in normal postpartum hemostasis.

Comments and Communications

The AEC Loyalty Oath

A letter that I wrote some time ago to Dr. Detlev W. Bronk, chairman of the National Research Council, in connection with the loyalty oaths now required of Atomic Energy Commission Fellows, is still timely. One of the points made in this letter is, indeed, strongly emphasized by the recent proposal, embodied in the O'Mahoney Amendment to the Independent Offices Appropriation Bill, for a mandatory FBI investigation of all AEC fellows: namely, the point that it is difficult to contain measures of this kind within those bounds which might be suggested by prudence or by a decent instinct of self-restraint.

Basically, the issue here is one of political freedom. The denial of educational rights or privileges to a citizen who would be eligible for them were it not for his failure to measure up to some arbitrary political test is a clear violation of the principles upon which our republic was founded. The essence of the matter has been stated with complete clarity by Mr. Justice Stone in his celebrated dissenting opinion (later adopted by a unanimous court in a spectacular reversal of its decision) in the so-called "Flag Salute Case"—Minersville School District *et al.*, vs. Gobitis, 310 US 601. That opinion should be read by anyone interested in the present discussion. Any attempt to distinguish between the situation met in the "Flag Salute Case" and the present one will only bring out the fact that the distinctions are completely secondary.

My letter follows:

Dear Dr. Bronk:

The statement issued by the Atomic Energy Commission on May 22 concerning the oaths and affidavits which will henceforth be required of holders of A. E. C. Fellowships is now available in its entirety, as published on page 552 of "Science" for May 27, 1949. Previous fragmentary reports concerning this statement had caused me to weigh its possible implications with great care. As a member of one of the boards created by the Council to pass on applicants for the A. E. C. Fellowships, I felt I should formulate and make explicit my own attitude toward the new situation. With the publication of the full statement before me, I am now able to arrive at a definite conclusion. I am therefore writing you to request that my resignation from the Postdoctoral A. E. C. Fellowship Board for Mathematics, Physics, and Chemistry, already placed in your hands under date of May 10 for reasons of a purely practical nature, be made effective at once.

A full statement of my reasons for this request would doubtless be inordinately long. There are, however, three main points which I might make here by way of briefly explaining those reasons. Fundamentally, it seems to me, the imposition of political conditions upon the pursuit of scholarship, however supported, is contrary to the political principles on which our nation is founded; prejudicial to the proper development of basic research in the United States; and most difficult to contain within those limits which the proponents of the current measures appear to accept as necessary. If I were not opposed to these measures on grounds of principle, I would nevertheless wish to withdraw from the atmosphere of suspicion which they will inevitably generate unless they are modified in the sequel by a practice of confining loyalty investigations of fellowship holders to those cases where classi-

fied research is involved. Finally, even if the submission of sworn statements were to be reduced in this manner to a kind of empty ritual, it would nevertheless be a ritual in which many a young man, already idealistically dedicated in his own eyes to the service of his countrymen, would participate only with a certain sense of humiliation and a corresponding feeling of resentment; and I could not bring myself to continue a remote but identifiable association with the compulsion to participate. On this last point I recall with clarity the feelings I experienced when required to take the so-called Teacher's Oath some years ago in Massachusetts, an oath which I could and did take with a perfectly clear conscience and without reservations.

You will understand, I am sure, that this letter, being an expression of conscientious beliefs and not a discussion of mere practical arrangements, is a communication which I do not feel bound to hold private.

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Method for Supplying a Laboratory with Warm Sea Water in Winter

One of the handicaps faced by the biologist working in northern waters is the long winter period when the water temperature is too low for active functioning of many invertebrates. In our case this period, when the water temperature in Long Island Sound is 5.0° C or less, may extend from four to almost five months. In severe winters a temperature of −1.5° C is often recorded (LOOSANOFF, V. L., *Ecology*, 1937, 18, 506). Under such conditions many forms are hibernating, while others are less active than at higher temperatures.

During the last five years we tried to overcome this difficulty by artificially increasing the temperature of sea water used in our experiments. The first attempts, which consisted in maintaining a high temperature in the experimental aquaria by means of electric heaters, were rather promising because they showed that oysters kept under such conditions could be induced to develop ripe eggs and spermatozoa even in the middle of winter (LOOSANOFF, V. L., *Science*, 1945, 102, 124). However, since the use of electric heaters was rather expensive, and because there were certain objections to keeping metal heaters and experimental animals in the same water, we did not consider the method entirely satisfactory and continued to seek a better one.

The principle of our present method is rather simple. Cold sea water is passed through a coiled lead pipe, which is immersed in a large tank filled with warm fresh water. The temperature of this water is maintained at the desired level by a gas flame regulated by a pilot light thermostat (Fig. 1, A). The temperature of sea water in the lead pipe leaving the tank is regulated by an electric thermostat, the bulb of which is attached to the pipe itself. This thermostat is also connected to the magnetic gas valve (Fig. 1, B) of the gas burner. If the temperature of outgoing warm sea water in the lead pipe decreases below a certain minimum, the thermostat sends a signal to the magnetic gas valve, which increases the gas flame. To prevent the stratification of warmer water in the upper part of the tank, a strong stream of air bubbles is continuously passed through the tank. In general, the system is simple and can be installed by a person familiar with installation of domestic hot water heaters. Ours was installed by our laboratory mechanic, Joseph Lucash.

The advantages of having warm running sea water in a laboratory are numerous, the most obvious being the possibility of conducting throughout or almost throughout the year many experiments which formerly had to be

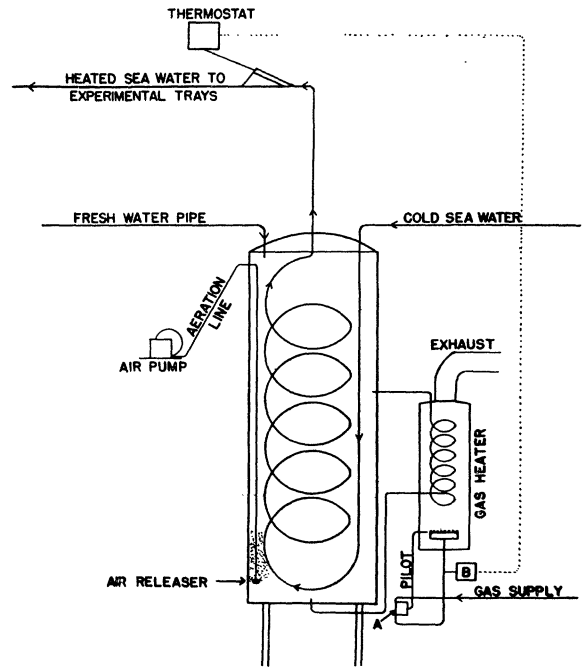

FIG. 1. Diagram showing method of raising temperature of cold sea water.

confined to the relatively short summer period. For example, by subjecting adult clams, *Venus mercenaria*, to gradually increasing temperatures during January, we induced them to spawn in February and March and grew their larvae to metamorphosis. For several years oysters were conditioned in the same way, and recently my colleague, Harry C. Davis, was successful in obtaining heavy sets of oysters in the middle of winter. No doubt similar success can be achieved with other forms which normally are inactive in winter.

By keeping the animals during the cold period at desired temperatures, laboratories can be assured of a sufficient supply of biological material, which is ordinarily unavailable in winter. For instance, we already know on the basis of our experience that embryological studies on eggs of some lamellibranchs can now be continued on almost a year-round basis. Thus, at least in this respect, we can hope to accomplish as much in one year now as could be done formerly in three or four.

Another advantage of a continuous supply of warm sea water in winter is that it is so easy to maintain streams of different temperatures by mixing warm and cold water in different proportions. We use streams of about 5.0, 10.0, 15.0, 20.0, 25.0, 30.0, and even 35.0° C.