Dr. Bart J. Bok, Associate Professor of Astronomy, Harvard University:

It is unnecessary for survivors of a shipwreck, in a life boat or life raft, to let nature take its course and drift wherever the winds and waves happen to carry the boat. A simplified approximate kind of navigation can be practiced.

The navigator of a life boat is not expected to be able to fix the boat's position accurately to within one mile. With limited available navigational equipment, there is every reason, however, to expect him to know at all times the boat's position to within ten or fifteen miles. A skillful and ingenious navigator will find it possible to manage very well by a judicious blending of dead reckoning and celestial navigation.

When the order to abandon ship is given, there are four items to attend to:

1. Take, if at all possible, an emergency package containing a current Nautical Almanac, a booklet with some special tables for use in emergencies, a protractor, ruler, paper and pencil, and dividers, all placed in a water-proof package.

2. Make certain that you and several others have a watch which is running. The watch can either be set on Greenwich Civil Time, or on a local time differing by a known number of hours from Greenwich time.

3. Record the latitude and longitude of the ship when it is being abandoned.

4. If possible, place a sextant in the life boat.

The importance of knowing the location of the ship when it is being abandoned and having a watch that is running and knowing the zone time by which it is set, cannot be overstressed. With this information, it is possible to determine one's latitude and longitude fairly accurately.

The selection of an initial course is one of the most important ones of the entire voyage. The distance to the nearest mainland, or to an island or group of islands, should naturally be considered. But it is well to remember that it may be wiser to attempt reaching a shore a thousand miles away, in the direction in which the boat would normally be carried by wind and currents, than one only two hundred fifty miles away in the opposite direction.

Dr. Marshall H. Stone, Professor of Mathematics, Harvard University:

Mathematics is important for the young man or woman who is laying the foundations for a scientific career. For anyone who has begun with an interest in physics the important part played by mathematics in scientific thinking is already becoming plain. However, the first studies in biology or geology do not usually reveal to the young scientist that his interests, if followed up, may lead him into situations where mathematics of a fairly high order may be essential to his understanding and progress.

It may safely be said that all the various branches of science do tend to become more mathematical and that, accordingly, the inclusion of sound mathematical training, embracing analytic geometry, the calculus, and statistics, in the basic program of preparation is likely to prove of inestimable value to the young scientist. The wisdom of obtaining such preparation in the earlier stages of scientific study lies in the often observed fact that the acquisition of basic mathematical knowledge at the time when it is most urgently needed by the investigator in his later career is extremely difficult if not practically impossible. Of course, the physicist, physical chemist, and engineer will in most cases desire a more extensive mathematical preparation than that described above.

Those who hope to open new frontiers in the "exact sciences" will indeed probably need all the mathematics they can work into their programs of study. As for those whose interests are already in mathematics itself, they will find that their studies open up a wealth of new concepts, and new problems, which they can hardly begin to imagine in the first year or two of college study.

Dr. E. U. Condon, Associate Director, Westinghouse Research Laboratories:

Progress in the study of atomic physics stopped in America about three and a half years ago when it became necessary for the physicists of the country to turn to development of new instruments of war. Work in basic science came essentially to a standstill somewhat earlier in Europe—first in Germany, then in the other nations as they belatedly recognized the sinister intentions of the Nazis.

It is especially important to make the point that physical science stagnates during war, because the contrary view is so often maintained by persons who do not distinguish between real scientific progress and the mere extension of the use of science for specific applications. During war time a great deal of progress is made in application of science to military jobs. But this is done under such pressure to get a specific result quickly that there is considered to be no time for the study of the basic problems of science. During war we run on our scientific capital. We exploit in every way all the science we know and, hating war as we do, we bend every effort to get it finished. We do this with an intensity which even fails to provide adequately for the training of the next generation of scientific workers. Such a policy is justifiable in a society which looks upon war with abhorrence—which wants to get a bad job over with quickly.

When the shooting is over then the biggest problem confronting us will be the establishment of a world society in which there will be the fullest incentives and opportunities for developing the best conditions of life for everyone. For us, who are particularly interested in science this means a world in which there will be liberal support for and appreciation of scientific research as an element of basic culture and as the source of the engineering progress of the future. We must not expect that this problem of the post-war world will necessarily be solved in a good way. It will require the best efforts of all of us to reorganize the messed-up world which we will inherit.

About the only thing we can be sure of is that there will be very great changes in the social, economic and political structure of the world from the forms with which we were familiar in the pre-war world. If we are to progress these new forms will be marked by a greater cooperativeness and mutual understanding both as between different groups in each country and as between the different peoples of the earth.

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ENGINEERING

"Thinking" Valve Used To Control Temperature

➤ FOR TEMPERATURE controls in larger structures, such as hotels and office buildings, Dr. Willis H. Carrier, executive head of the well-known engineering firm that bears his name, offers what has been nicknamed a "thinking" valve, which is protected by patent No. 2,342,328.

Temperature control in such large buildings is usually effected by two distinct systems of circulating coils, one for cold, the other for heat. Hitherto each of these systems has required its separate control valve and thermostat set-up. By making a single valve responsible for the control of both heating and cooling coils, Dr. Carrier's invention decreases both complexity and cost.

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