

NUCLEAR PHYSICS

H-Bomb Is Not End of Life

The most gigantic H-bomb would not explode the atmosphere or the waters of the ocean. There is less in the H-bomb than in the A-bomb to propagate a chain reaction.

► NOT even a monster super-H-bomb, the most gigantic that can be visualized, would explode the atmosphere of the earth or the waters of the oceans, ending life on the earth as we know it.

That is the best judgment of scientists, despite the alarming statements of a few physicists. The damage that a dozen or so H-bombs could do to big cities is quite alarming enough without calling upon a chain reaction in the atmosphere or the seas.

There is energy (excess mass that turns into energy) when hydrogen, oxygen and nitrogen of the air and water are transmuted to other elements. That is clear and no scientist disputes this fact. But in the explosion of an H-bomb there is even less than in an A-bomb of the sort of radiation and other debris that would propagate a chain reaction, particularly in the light elements.

In the H-bomb the process is more of a combination of the light-weight elements involved to make other elements with an incidental loss of mass or matter, which turns into energy. This is what is called fusion. In the uranium-plutonium atomic bomb it is a matter of these two very heavy elements splitting into other middle-weight elements, with a slight loss of mass that turns into energy. This is called fission.

In fission of the A-bomb, neutrons in excess are let loose and this makes possible the extremely rapid chain reaction. Probably neutrons do not have such a key role in the so-called hydrogen bomb, which seems to be a matter of smacking together the atoms of the hydrogen isotopes, deuterium and tritium (double and triple weight hydrogen), one or the other or both.

To set off a chain reaction in the atmosphere or in water, something to react with the oxygen and hydrogen of the water and the nitrogen and oxygen of air would have to be produced in profusion. This does not seem to be provided by the H-bomb if guesses as to its nature are correct.

Not only that, but if the triggers or inciting radiations were present, the atoms of the air and water are too far apart to be easily acted upon and transmuted in bulk as would be necessary for an "end-of-the-world" disaster. It is quite probable that one of the problems of the hydrogen bomb will be to get the hydrogen, normally a gas in free state, into such solid or compact state that it will be able to react in large quantity very quickly.

If there was believed to be any considerable risk to an atmospheric or oceanic chain

explosion, it is very likely that even the Russians would think a long time before risking a test. We must assume that since they seem to want to have a communistic world, they will not risk anything that they believed would envelope the whole earth in flame.

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GENETICS

Who Has Marriage Choice Is Essay Subject

► A WOMAN'S choice of marrying material may be much more restricted than she thinks. The American Genetic Association suspects that this is true and, in an effort to make sure, is sponsoring a \$2,000 essay contest.

The association expects the qualified applicants to write between 25,000 and 50,000 words on some of the factors which limit the choice of a mate and the effects of those limitations on heredity.

It has long been known that geography forces the men and women in some com-

munities to keep marrying back and forth between the same few families. But very little work has been done on other factors which keep a group of people isolated in their marriage habits through generations.

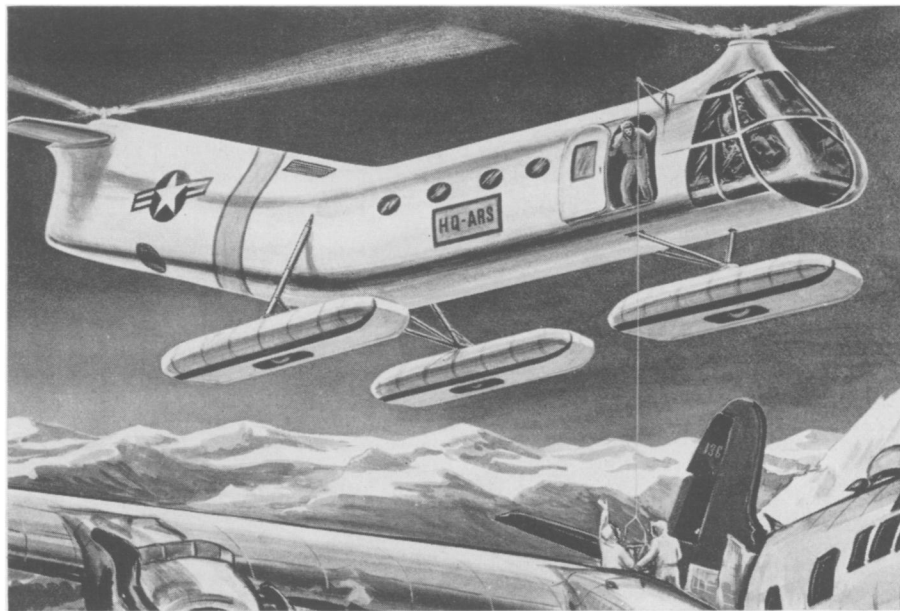
In one community in North Carolina, for instance, 76% of all marriages were between members of the same church congregation. Other factors which limit a woman's choice of a man are physique, race, religion, family, social position, occupation and wealth.

When a group of people all follow the same general set of limitations in choosing mates and, consequently, intermarry within themselves for several generations, the geneticists call that group an "isolate." The geneticists have found that in both human and animal isolates, recessive hereditary defects tend to crop up more often. These defects may be tendencies toward deafness, diabetes, rheumatic fever, feeble-mindedness and even some forms of cancer.

Since no one knows how many human mating isolates there are in the United States, nor what size they are, the contest is being held to find out. Qualified students in the fields of genetics, sociology and statistics will be asked to make studies of such groups of people and report their findings in the contest essays.

Once the geneticists know more about isolates in this country, they can go ahead with studies of how recessive hereditary defects operate and, perhaps, come up with the answers to some of our hereditary diseases.

Science News Letter, March 4, 1950



"OMNIPHIBIOUS HELICOPTER"—The world's first helicopter designed specifically for large scale rescue work in the Arctic will be able to land on snow, ice, water, tundra, marsh or land without changing gear. The 20-foot long cabin can accommodate up to 12 litters plus two seats for medical attendants, or 20 troop seats, or as many as 27 persons can be carried in the floor of the big cabin.