

PHYSICS

Visible Distances Set

Pilots work out formula to tell how far you can see from various altitudes. Flyers over English Channel can see Germany.

► HOW FAR can your friend in the Air Forces see from 25,000 feet up? Pilots as well as airline passengers often wonder how far they can see from upstairs.

Distances at altitudes are even more deceiving than on the surface at sea-level. One Pan American Airways' passenger, for example, on a flight that had to climb to 20,000 feet over Brazil, insisted that she could see the coast of Africa. That the coast of Africa was 1,822 air miles from the mouth of the Amazon fazed her not one whit.

Clipper pilots, attempting to answer queries from passengers, and to justify or deny such claims of long range visibility from various heights, came across the surprising fact that practically no one knows how far you can really see. With that fact in hand, the Pan American Clipper Captains got together, went through the research files and produced the scientific answer. They call it the Clipper Captain's "vision-range" formula.

It will tell, for example, that given good visibility on a relatively cloudless day, a pilot of a Flying Fortress, cruising at 25,000 feet, can see right into Germany before he is out of sight of England's Channel coast. From Tunisia, from the same altitude, he can see a dark mass on the far horizon, which would be the middle of Sicily. The higher you go, of course, the farther you can see. By elevating yourself, you can look right over the curvature of the earth.

The actual curvature of the earth for the first mile is about nine inches, and increases thereafter at a rate approximately equal to the square of the distance in feet. If approximate curvature of the earth for any distance is wanted, multiply the square of the distance in miles by .67. The answer will tell you how much the earth has curved under at that point. For example, the surface of the earth 10 miles from where you are standing is 67 feet lower than you are.

On the surface of the sea, at eye level, the range of vision is only 2.9 miles. On land, since the earth itself varies in altitude, the range of vision is always at least the same 2.9 miles plus the distance reflected by altitude of the individual

and the object's altitude.

With that background, the Clipper Captains finally worked out the following "vision range" formula to tell how far the average person can see from various heights.

The range of vision is equal to the square root of the altitude multiplied by 1.225 miles. For example, at 1,000 feet, you can see for 38.8 miles. From 10,000 feet, you can see for 122.5 miles. And for those who are somewhat rusty on their mathematics, the Clipper Captains compiled a table:

From 1,000 feet—you can see—	39 miles
" 2,000 " " " "	55 "
" 3,000 " " " "	67 "
" 4,000 " " " "	77 "
" 5,000 " " " "	87 "
" 10,000 " " " "	123 "
" 15,000 " " " "	150 "
" 20,000 " " " "	173 "
" 25,000 " " " "	194 "

Science News Letter, June 5, 1943

CHILD CARE

Way Baby Behaves May Guide Young Mothers

► MANY a new mother would be less frightened and make fewer mistakes in caring for and bringing up her baby if she let his actions and reactions guide her. How to dress the baby is a simple example. Doctors, nurses and stores that sell infant's wear can give mother a list of suitable clothes, but she will still be faced with the problem of when to put on an extra sweater or heavier underwear to keep baby warm, and when to take off everything but his diapers to keep him comfortably cool. Long before baby can tell her in words how he feels, he can shiver if he is cold, and perspire if he is too warm. He can also cry, and will, if he is too uncomfortable for any reason. He will squirm and wriggle and try to kick as well as cry if his clothes are tight or his blankets wrapped too tightly.

Baby's actions can guide her, also, on the often difficult feeding problem. Even at a very early age babies have a way of knowing how much food they require. A healthy baby, after the first few days

of life, can be trusted to take enough milk at a feeding or nursing and not to overeat. It seems foolish to spoil the efficiency of this innate knowledge by insisting that baby take just so many ounces, no more and no less, at every feeding.

Many other ways in which mother can learn how to care for her baby from observing him and understanding how he grows are given in a book which has just come off the press, *Babies Are Human Beings*, by Dr. C. Anderson Aldrich, associate professor of pediatrics at Northwestern University Medical School, and his wife, Mary M. Aldrich (Macmillan). Since the authors have raised a family of their own, they write with real understanding of the practical as well as the medical problems involved.

Science News Letter, June 5, 1943

PUBLIC HEALTH

Industrial Hygienists Told They Are "Expendables"

► INDUSTRIAL hygienists may well regard themselves as the "expendables" in the important rear-guard action of "holding the lines against preventable disease in the population sustaining the armed forces and producing the essentials of war," Chief Sanitary Engineer John J. Bloomfield, of the states relation section of the National Institute of Health, U. S. Public Health Service, declared at the National Conference of Governmental Industrial Hygienists.

They must concentrate all their strength and resources, which are not likely to be increased although their tasks and responsibilities are ever growing, to their "first and most important duty" of reducing industrial disability in its strictest sense, Mr. Bloomfield declared.

This means hewing to the line of establishing and keeping safe and healthful conditions in the factories and work places, protecting the war workers from accidents and health dangers arising from their jobs.

"There is not a single industrial hygiene unit that can claim to have carried out this responsibility to so great a perfection," he stated, "that it can branch away from this objective and actively undertake tuberculosis control, venereal disease control or nutrition work in the plant as some are doing."

"Open the doors" to workers in these other health fields, he advocated, but "do not try to be all things to all men."

Science News Letter, June 5, 1943