SCIENCE NEWS

THE PSYCHOLOGY OF AUTO DRIVERS

Science Service

NATION-WIDE standardized mental tests for auto drivers to determine the kind of machine each individual shall be permitted to run is the plan for cutting down our alarming motor-car accident toll urged by Dr. Raymond Dodge, professor of psychology in Wesleyan University, and this year chairman of the division of psychology of the National Research Council.

"All persons are not equally suited to driving a car," he said. "One man in an emergency gets and acts on an idea quickly, another slowly. The time that elapses after a danger is seen until the driver can start the movement that is required to avoid it is an important factor in safety. Slow and uncertain or wavering actions are undoubtedly the occasion of many accidents. This slowness is in part due to lack of practice and training and in part due to the natural tendencies of the individual. Both of these factors can be made matters of test."

"The natural speed with which a person acts, his 'reaction time' can be easily measured and the relative ability of chauffeurs in this respect could be determined," Dr. Dodge explained. "The time that it takes for a signal to reach the eye, be transmitted to the brain, and for the brain to send its order down through the nerves of the arm seems instantaneous, but it can be measured by the reaction time test used in our psychological laboratories every day. A person is seated at a table with his finger on a telegraph key. As soon as he sees a given signal he presses the key. When the signal flashes, the electric current also starts a pointer marking off the fractions of a second upon a dial. When the key is pressed the current is broken and the hand on the dial stops moving. This gives a record of the time it took the person to get and act upon the idea."

"Tests for driving ability," he continued, "should be varied according to the sort of tasks which the drivers are called upon to perform. Tests for drivers of light, pleasure vehicles might be very different from tests for drivers of fast ambulances and fire appliances, and they in turn might be quite different from tests for drivers of heavy motor trucks. High powered fast machines obviously should not be entrusted to poor or relatively untrained chauffeurs. A specific form of test for various types of machines is good common sense and good science.

"In addition to tests for mechanical expertness, knowledge of traffic regulations and automobile limitations should also be required."

Jailing reckless drivers and requiring speeders to view accident victims in the morgue are haphazard methods. Licenses to drive should not be issued to persons with such tendencies to motor manslaughter. It is perfectly possible that the psychologists will be able to work out tests to determine the moral tendencies and regard for common interests of applicants for driver's licenses.

"Careful analysis and expert thoroughgoing experimental investigation of these and other problems involving the mental processes of those who use the highways should be made," Dr. Dodge emphasized. "When there has been a systematic exploration of the human factor in traffic, tests can be standardized.

"It is notorious that tests for drivers in one community are entirely different from tests in other communities. Licenses from different localities are quite incomparable in value. It is obvious that the same ability to drive is not required on a country road as in the city, but if the farmer is to drive into town, he must be able to handle his machine under city traffic conditions or else not be allowed to come in. Standard tests would help remedy this situation.

"Even now we should have a national blacklist for chauffeurs so that those who have forfeited their licenses on account of bad driving in one state can not go over into another state and continue their homicidal practices."

CHRISTMAS TREES OLD IN LEGEND AND EVOLUTION

Science Service

CHRISTMAS trees, as a family, are of the oldest of our trees to-day. For reasons connected with their antiquity, experts of the U. S. Forest Service say that these evergreens have become so popular for Yule-tide decorations that between four and five million trees are consumed in this country every year, while plantations which raise Christ-

mas trees as a farm crop are springing up to help supply the future demand.

These conifers or cone-bearing trees that hold the bright gifts and cheerful tinsel of this religious festival and winter holiday were the earliest of trees, and their direct ancestors were the first flowering plants on earth. They probably originated during a period of rigorous climate and their thin needle-leaves present less surface to cold and exposure than the broad-leaved trees which represent a later stage in plant evolution.

And these needles are probably responsible for the use of the conifers as Christmas trees. They present only a small surface to the effect of evaporation and so enable the tree to retain its moisture and keep green. This greenness added a touch of life to the dullness of winter and made the evergreens popular as decorations. Legends and custom did the rest.

There are many kinds of these evergreens, but the principal ones used for Christmas trees in various parts of the United States are the pines, spruces, firs and cedars. If you do not know what kind of a tree it is that bears your gifts, you can easily tell by looking at the needles on the branches. In the pines, the needles grow in bunches of from one to five needles to the bunch. If the individual needles in these bunches are pressed together they form a complete cylinder. Some kinds of pine have two needles to the bunch, but these two are each half cylinders, while in those having three needle bunches the three needles form a cylinder, and so on.

If the tree is a fir, the needles grow out from the two sides of the stem, while in the spruce the needles grow out in all directions around the stems. In the cedar, the needles are like little twigs pressed compactly together in a sort of shingle-like formation.

Joy-killers frequently arise and bewail the cutting of these trees for Christmas use as wasteful. But aside from the joy they bring the kiddies, U. S. Forest Service officials believe that properly done the cutting of Christmas trees can really be made a Christmas gift to the forests themselves.

In Maine and the Adirondacks, the principal localities that supply Christmas trees, there are frequently as many as 50,000 to 100,000 seedlings to the acre. Few of these can reach maturity. It is essential for the production of tall, clean timber that there should be at the beginning many trees to the acre, but unless these are thinned out, the poorer trees may hamper the development of the better ones.

Man, by interfering in the struggle and thinning out of all lagging trees, can hasten the growth of the remaining trees. In many localities, this work depends on the possibility of finding a market for the small trees to pay for the cost of the thinning, and the Christmas market solves the problem.

In Michigan, however, the state agricultural station several years ago started raising Christmas trees as a farm crop. They have just issued information telling how this can be done commercially and encouraging farmers to plant for this purpose.

WAITING FOR TREE PLANTERS

New York State College of Forestry

EVERY home owner in New York State is paying heavy freight on the lumber of which his house is made. Every lessee of an apartment or dwelling is paying in rent large amounts for freight on the lumber used in the construction of the building in which he lives, according to the New York State College of Forestry at Syracuse University. The people of the Empire State—relative figures apply to all the eastern states—are taxed for freight approximately $22 a thousand on yellow pine, $27 on Douglas fir, $12 on North Carolina pine, $12 on white pine, and $20 on imported hardwoods. The freight rate on Douglas fir which comes from the Pacific Coast is more than the lumber costs at the mill.

Thirty-five million dollars are taken from the pockets of the citizens of New York every year for freight on imported lumber. In addition to this freight bill of $35,000,000 on lumber must be added the cost of shipping 55 per cent. of our pulpwood into the state from Canada and other points. The transportation costs are bound to grow as the depletion of the nearest lumber and wood supply continues and the demand increases.

Much of the lumber consumed in the east is shipped from the south. It is estimated that in the course of ten to fifteen years the southern field will be exhausted insofar as outside consumption is concerned. Then Oregon, Washington and California will have a practical monopoly of the lumber business which will bring about materially increased freight charges to eastern consumers.

Measures should be taken to overcome this condition as far as it is now possible. A large portion of the lumber and other wood products used in New York could and should be grown within the state, and forests should be planted wherever land is suitable for that purpose. More than

4,000,000 acres of idle land in New York and about 85,000,000 acres in the United States (a tract about as large as New York, Pennsylvania, Rhode Island, Connecticut and New Jersey) are waiting for tree planters.

THE SPEED OF STARS

Science Service

TWO HUNDRED miles a second is the speed at which some stars are racing through space, Dr. Walter S. Adams, acting director of the Mount Wilson Observatory, declared in a lecture at the Carnegie Institution of Washington.

The rapidity with which the stars move depends upon their stage of development, their true or intrinsic brightness and probably their mass. The giant stars are moving more slowly than the dwarf stars and the increase of velocity with decreasing mass is a regular one. But these individual stars, he pointed out, are not moving at random. They move in great streams and the speedway of the heavens is in the plane of the Milky Way.

"None of the rapidly moving stars are going in the same direction as our sun," he said. "The speed of the sun is about twelve miles a second when referred to the slowly moving stars and over one hundred miles a second with reference to the exceptionally speedy stars.

"From a knowledge of the spectrum of stars we have been able in the past to learn both their chemical constitution and order of evolution as regards temperature and physical state, and their motions toward or away from the earth in miles a second. In recent years we have been able to add a third use to which the spectrum may be put, and we can now determine the true or intrinsic brightness of a star directly. This quantity combined with a knowledge of its brightness as it appears to us enables us to determine its distance in a very simple manner."

The method has nearly tripled the number of stars for which we know the distances, Dr. Adams said, and a knowledge of the distances has made it possible to determine the true motions of these stars in space.

FLYING CHEAP TRAVEL

Science Service

IF airplanes could get enough business, passengers could be carried much more quickly at little greater cost than by railroad, Archibald Black, aeronautical engineer of Garden City, N. Y., told the American Society of Mechanical Engineers while discussing the proper design for commercial flying machines. "For example, the distance from New York to Chicago by the Pennsylvania Railroad is 908 miles, or a flying distance of from 750 to 800 miles," he said. "Were it possible to load the airplane fully each trip, the operating cost would be 6.5 cents per passenger mile or $48.75 to $52 per passenger. This compares with the railroad rate of $51.30, including fare, excess fare and Pullman. Allowing for the trip to and from the fields, as well as an intermediate stop, the time by air would average about nine hours as against twenty hours by the Pennsylvania Railroad's 'Broadway Limited.' The only reason why airplanes can not carry passengers at such rates to-day is that it costs too much to get the business."

Moderate size machines only, he emphasized, could be efficiently operated at this low cost and the requirement of ability to fly on one of two engines is utterly impractical for commercial airplanes because of the prohibitive cost. The commercial plane should be designed for jumps lasting not over four hours, while high speed is undesirable and high climbing ability unnecessary and impractical for the commercial craft.

A MARVELLOUS ARCHEOLOGICAL DISCOVERY

London Times

THE earth holds in her recesses the rich memories of our race, and sometimes, as though the effort of the reflective and inquiring mind of modern man had suddenly flashed forth in a revealing intuition, a discovery comes that lights up the obscurity of the distant past. One such discovery we are privileged to record to-day. Our Cairo correspondent tells us how, after sixteen years of patient toil and research, Lord Carnarvon and that distinguished excavator, Mr. Howard Carter, have been rewarded by a marvelous find in the Valley of the Kings near Thebes. All the mysteries of this famous valley had been disclosed, so it was thought, long since. Mr. Carter, with the pertinacity of the gifted archeologist who scents discoveries from afar, dug on persistently until at last, in the royal necropolis of the Theban empire, he came across some tempting signs below the tomb of Rameses VI. Lord Carnarvon went out from England, and he and Mr. Carter together opened the sealed doors of a hitherto unnoticed chamber. When opened this chamber revealed an amazing spectacle. There were gilt couches, inlaid with ivory and precious stones; innumerable boxes, inlaid and painted with entrancing hunting scenes; a wonderful throne; a chair encrusted with precious stones and

adorned with royal portraits; bituminized statues of a king, chariots, maces, a footstool, alabaster vases, and quantities of trussed duck and haunches of venison, left, according to the ancient custom, as provision for the great dead. Beyond the first chamber lay another chamber crowded with a confusion of gold beds, boxes and alabaster vases, and beyond this, again, lies another chamber which may prove to be the actual tomb of the king whose funeral relics lie in bewildering profusion in the first two rooms. The name of the king who thus emerges in splendor from the dim past into the murky light of our troubled day is Tutankhamen, of the Eighteenth Dynasty, who reigned in Tel-el Amarna and Thebes over three thousand years ago. Little was known of him except that he claimed to be a son of the famous Amenhotep III, and that he married the daughter of that strange Pharaoh Akhenaten, who revolutionized the Egyptian religion by instituting in the worship of the rays of the sun a kind of monotheism, and at the same time promoted a remarkable artistic revival. Of Tutankhamen the chief fact hitherto attested is that in his reign the traditional religion, with its worship of Amen as the principal deity, once more claimed its own. He was, so to speak, the patron of a counter-reformation. Now, thanks to this remarkable discovery, we may perhaps learn more of the circumstances of this strange ebb and flow of religious emotion in the days when mankind was still young. And though the world is old now and restless still, with the craving for power and for a knowledge of great mysteries, even now when the eastern lands are trembling between war and peace and a Europe undreamed of by the Pharaohs is wrestling with problems that would have been stranger to them than all their weird panoply is to us, that figure of the ancient king who thus suddenly steps out from oblivion has a permanent significance. On his footstool are figures symbolizing his lordship over Syria, and the peoples of Ethiopia owned his sway. Around him are the confused tokens of a reversion from a groping after new spiritual ideas to the comfortable forms of an ancient ritual.

PRELIMINARY TRANS-ATLANTIC RADIO AMATEUR TESTS SUCCESSFUL

Science Service

MESSAGES broadcasted by amateur radio stations in preliminary trans-Atlantic tests just completed were received across the water in England, reports from that country say.

For ten days on predetermined schedules, amateur radio enthusiasts in all parts of Canada and the United States competed in order to qualify for a special place in the final trans-Atlantic tests that will be held between December 12 and 31. To qualify they had to be heard by a station at least 1,200 air miles away. Indications are that many will compete in the final tests.

The way in which the amateurs in the different radio districts kept within their allotted times was gratifying, according to officials of the American Radio Relay League, who are managing the tests.

At least 20,000 radio amateurs are competing in these tests, it is estimated.

ITEMS

Science Service

WORDS from a language which flourished centuries before Columbus are being used for names of varieties of the fruit, avocado or "alligator-pear," which is relatively new to this country. The U. S. Department of Agriculture has introduced Mayan names along with this salad-making fruit that its experts have brought from Guatemala, where centuries ago an ancient civilization flourished. Some folks seeing certain kinds of "alligator pears" taged "Itzamna," "Lamat," "Hunapuh," "Kayab," "Mayapan" and others equally strange, may have thought that the government has enlisted the services of the namer of Pullman cars. It has just been explained by the department that these names are taken from the Maya who built up in what are now the wilds of Guatemala great cities and a powerful agricultural civilization hundreds of years before Columbus ever left the old world. The avocado called "Itzama" is named after the chief Mayan god, the creator of mankind and the father of all the other gods. Such names as "Lamat" and "Hunapuh" designated days in the wonderful calendar of these ancient people, who had invented a system of chronology more accurate than the time systems of the Europeans of their time. "Mayapan," the name given to another variety of this salad fruit, was one of the important cities of this people. It means "place where there are Mayas."

THE *Santa Maria*, a commercial flying boat of the Aeromarine Company of New York, has flown 45,000 miles.

AIRPLANES are carrying mail in Morocco over a route formerly covered only by means of camels and donkeys.