DR. RICHARD B. GOLDSCHMIDT, professor of zoology at the University of California at Berkeley, has presented to the university a collection of letters from eminent biologists of the twentieth century. The letters form part of correspondence with Dr. Goldschmidt. The collection does not contain complete sets of the correspondence, as a large part of Dr. Goldschmidt's files were destroyed when he left Germany in 1936.

THE exhibits, on science, agriculture and education, prepared by the University of California for the Golden Gate International Exposition in San Francisco, valued at $80,000, have been presented to the university by the California Commission, a body created by the Governor to aid the Exposition. The exhibit "Science in the Service of Man" was prepared by the university with the cooperation of other educational institutions, and some of the exhibits from the Hall of Science will be presented to these institutions. President Sproul's committee to assist the commission will distribute the exhibits to the seven divisions and the various departments of the university. They will be used primarily for teaching and research purposes.

AN expanded program of research in pulp, paper and related products is provided for in a new agreement entered into by the Federal Department of Mines and Resources with the Canadian Pulp and Paper Association and McGill University. According to *The New York Times,* under the terms of this agreement the association undertakes to provide greatly increased support for the extension of studies aimed at the improvement of production methods and the reduction of manufacturing costs. The first agreement for such cooperative activity was entered into twelve years ago, at which time the association erected a special research building on a site provided by McGill University. It is pointed out by the *Times* that McGill, as well as other Canadian universities, finds through the pulp and paper industries a broad field of employment for graduates in engineering, chemistry and related sciences.

DISCUSSION

PERCEPTUAL DISORIENTATION DURING LANDING OF AIRPLANE

IN October, 1937, when making a plane trip to Texas, I had a striking experience in disorientation. During the intervening three years, despite frequent recitals of the experience, I have found but one other plane passenger who has observed the phenomenon. The phenomenon, as occurring in the airplane setting, is unknown to several psychologists who have been approached. It is likewise new to several aeronautical experts who have been told of it—including the pioneer, William B. Stout.

An opportunity to check the experience came on October 6, 1940. It faithfully repeated. Only the second episode need be related here. This second experience took place while using a TWA plane from Cincinnati to Detroit—a daytime trip in clear, sunny weather. I sat alone, facing forward, in a front left-side seat, next to the window. There were no passengers across the aisle, and I thus had a clear view through the right-side windows also.

The plane came down to make the Dayton Airport stop. As it levelled off, the disorientation phenomenon faithfully repeated itself. That is, after the plane has come down to the edge of the field, and has started to skim along the runway, the phenomenon begins. Looking out of the left window (with my face against it) the level field appeared as it should appear—horizontal. Glancing quickly across the aisle to look at the field through the right windows, the field was not as it should be: it appeared to slope down forward at an angle of about 15 degrees.

For the next 2,000 or 3,000 feet of travel, while the plane flew (or later rolled) along the runway, I rapidly looked back and forth eight or ten times. In spite of knowing perfectly well that the ground on one side was a continuation of that on the other, and in spite of these rapid and repeated opportunities to compare the ground on the two sides, the ground to the left remained horizontal, and that to the right persisted with its forward downhill slope.

When the plane, with a low remaining speed, wheeled through a short turn to taxi back, the phenomenon abruptly ceased.

The explanation offered below finds approval among the psychologists approached so far. With my face against my left window, the frame of my window is too far beyond my angle of vision to be allowed to act as a frame of reference. Thus, as long as the plane does not go into acrobatics, and sticks to minor lateral shifts or makes gentle glides to airports, I am given a full chance to reorient the ground and agree with myself that it is still horizontal.

But in looking across the aisle, a different story is presented. In level flight, the fuselage of the plane is for a long time approximately horizontal; also, the window frame lines are then horizontal and vertical. In particular, the eye has observed that the top and bottom window frame lines are parallel with the horizon.

Then, after the plane has changed its angle for landing, the fuselage is tilted upward by perhaps 15 degrees. One's intelligence therefore tells him that the ground is still horizontal, and that it is the window lines that have tilted upward. But the illusion takes charge and remains in charge. The window lines, which had been horizontal, continue to seem horizontal; the ground takes the blame, and seems to slope. The effect remains until the plane stops, or makes a turn at the end of the runway.

For the passenger, this is just another curious psychological experience; but it is conceivable that for the pilot, it might on occasion mean disaster. In landing by instruments, instruments can fail; and a daylight visual landing might have to be made. What then? It may be that with all plane designs ever produced up to now, the pilot can remain free from the effect. But some new design, perhaps combined with incidental shutting off of forward vision by frost or oil on the windshield, might place the pilot under the necessary conditions. Resulting confusion could have serious results.

Until some one makes tests, it would seem that to avoid the trouble, cockpit windows should have curved frames, rather than rectangular. This suggestion grows out of what one sees from the left-side window of the incident described. In addition to seeing the ground, a large part of my visual field was filled with a view of the wing and the nacelle. Obviously, these parts did not cause disorientation, even though they, like the right-hand window frames, had changed angle with respect to the ground. These parts present only curved outlines. Therefore, it may be that with all frame-of-reference lines curved, the disorientation would not occur.

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FROST RINGS IN LONGLEAF PINE

"FROST rings," abnormal zones of parenchymatous wood resulting from freezing temperatures during the growing season, are of common occurrence in northern and western trees.[1] To the writer's knowledge, however, their occurrence in longleaf pine (*Pinus palustris* Mill.) has not been previously reported.

Increment cores from second-growth stands of this species in southern Mississippi frequently have a conspicuous yellow- to tan-colored zone in the springwood of the 1932 ring. Microscopic examination shows the laterally displaced rays, distorted xylem elements and short-celled parenchyma that characterize frost injury. Weather Bureau records for Mississippi report the February of 1932 as the "warmest February in the records of this section beginning in 1888." The mean monthly temperature was 59.1° F., nearly 10 degrees higher than normal. This exceptionally warm period was followed by temperatures of 20° to 24° throughout southern Mississippi on March 9 and 10.[2]

Generally the injury is found in the beginning of the second or third ring from the pith, since usually only the 1- or 2-year-old shoots were affected. From 0 to 12 rows of normal springwood cells may intervene between the end of the 1931 growth and the frost ring, indicating the extent of growth previous to the period of freezing weather.

The malformation is present at breast height in most of the trees small enough to have been affected. Since second-growth longleaf is often marked by "false" rings and extremely narrow rings resulting from fire, the presence of a distinctive ring caused some years ago has been of service in growth measurements.

EARL L. STONE, JR.

SOUTHERN FOREST EXPERIMENT STATION

[1] A. S. Rhoads, *U. S. Dept. Agr. Bull.* 1131. 1923.

THE SUPERVISION OF PUBLICATION

DR. ATHERTON SEIDELL, writing in SCIENCE,[1] finds some fault with the distribution of scientific contributions among scientific workers in view of the difficulty and expense to which the worker is put in obtaining for his study the articles in which he is interested.

Dr. Seidell tries to criticize constructively, for he offers a recommendation for the solution of the problem:

> It is evident [he states] that a complete reorganization of the present system of publishing the results of scientific investigation is needed. Toward this end an advisory council on publication should be organized in each country for the purpose of studying the existing periodicals and defining more precisely the character of the contributions to be published in each. A system of routing the original communications in accordance with the field covered by each journal should also be established. The more highly specialized periodicals produced in this manner would enable the subscribers to receive more papers in which they are interested and fewer on subjects with which they are not concerned. The individual research worker would find it to his advantage to subscribe to them, and the cost of their publication would thus be distributed to an increasing extent among those for whose special benefit they are produced. *The supervision of publication by a central agency in each country would probably result in the elimination of some journals* [italics mine *sic*] and avoidance of the many changes in character, policy, title, size, price, etc., in others which now so greatly complicate the collection and maintenance of complete sets of periodicals by libraries and the task of making bibliographic searches in them.

Dr. Seidell, now with the U. S. Public Health Ser-

[2] U. S. Weather Bureau, Climatological Data, Mississippi Section, February, March, 1932.

[1] SCIENCE, 92: 345, 1940.