

AERONAUTICS

Atlantic Air Crowded; 34 Plane Crossings

THE once-deserted air above the formerly lonely Atlantic Ocean is positively crowded with planes these days, a glimpse at the trans-oceanic flight tally this year shows.

By July 22, no less than 34 crossings will have been made by three airlines of two nations. This is ten more than were made in the summer of 1937, when German, English and American ships compiled the previous high mark of crossings for a single year.

Pan American Airways will have a total of 24 transatlantic flights by this date, divided among two survey trips, ten crossings on the Marseilles route and two on the Southampton run with mail, and seven Marseilles and three Southampton flights with passengers. Air France Transatlantique, French entrant, will have completed six crossings, two by the Ville de Saint Pierre and four by the Lieutenant de Vaisseau Paris, its survey flying boats. American Export Airlines' Transatlantic has made three crossings. Delivery of a twin-engined Consolidated flying boat similar to U. S. Navy patrol bombers to the British Air Ministry makes the thirtieth.

The rooth crossing this year will be made before the end of October if present plans of the different airlines are adhered to.

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BOTANY

Light Increases Resistance Of Plants to Killing Heat

MIDSUMMER heat beats down on the cornfields, and you wonder how the plants stand it. One would think they'd wilt, even when there isn't any drought, standing there hour after hour in the unrelenting sun. The torrid climax that comes between noon and about two o'clock seems especially lethal.

So it might be, if the sun did not with its light aid the plants that must later in the day stand up against the dark arrows of its heat. Exposure to light for a few hours materially increases the ability of plants to withstand heat, Dr. H. H. Laude of the Kansas Agricultural Experiment Station has found.

In ordinary experience the thing is done automatically. Light is turned on when the sun comes up, and the plant gets its parathermal toning-up in the cool of the forenoon. To separate the effects in order to make a more exact

study of their relations, Dr. Laude grew several varieties of ordinary grain crop plants in rooms that could be lighted and darkened, heated and cooled, at will.

He discovered, for example, that if a 122-degree temperature were turned on to a plant that had just been taken out of darkness, it suffered much more than did a control plant that had been illuminated by forenoon sunlight for several hours before being exposed to the same degree of heat.

Artificial light appears to be as effective as sunlight in conferring this protection against heat. Plants kept under a 200-watt lamp over night showed only a little more than a third as much injury, after five hours' exposure to 120 degrees, as did plants that had been kept in normal night-time darkness.

The physiological mechanism of this parathermal action of light is still unknown. Dr. Laude suggests that it may be due to the formation of photosynthetic products in the plant, but he discounts his own suggestion.

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ASTRONOMY

Oxygen in "Empty" Space With Perhaps Other Gases

"EMPTY" space between the stars actually contains one of the two common gases present in the earth's atmosphere, oxygen, and it may also contain the other, nitrogen. Hydrogen is the third gas present in interstellar spaces in detectable concentrations.

First studies of remote interstellar "atmosphere" were announced at the meeting of the American Association for the Advancement of Science in Milwaukee by Dr. Otto Struve, director of Yerkes Observatory and of the new McDonald Observatory in Texas. It was at the latter institution that the studies were made, with a powerful new instrument known as the nebular spectrograph. Three-hour exposures were necessary, using specially sensitized photographic plates, to get "snapshots" of the faint glow of these gases of space, split up into the lines that tell of their chemical nature. Sixty-five such spectral photographs have been made. These gases, and indeed all kinds of drifting matter in the deeps between the stars, are of course very thinly spread out. Dr. Joel Stebbins of Washburn Observatory stated that light traveling through one mile of the earth's atmosphere loses more of its intensity through bumping into things than it would in passing through a quadrillion miles of interstellar space.

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IN SCIENCE

ARCHAEOLOGY

Greek-Style Drama Was Acted 1250 B.C. in Syria

IF GREEKS were Fathers of classic drama, Near Easterners of Syria were Grandfathers of the same type of artistic expression. It appears that they were acting "Greek" tragedy long before the Greeks.

The evidence consists of librettos of two sacred pantomimes. They are from the ruins of Ras Shamra on the Syrian coast, and are written on clay tablets in cuneiform alphabet letters. The very alphabet writing of Ras Shamra surprised archaeologists when they first encountered it, as they dug out the library collections of this dead city. Now, they are reading the old writings and learning more about backgrounds of psalms and other literary forms.

A British scholar, Theodor Gaster, first detected ancient playwriting technique in what might be taken for merely a narrative poem. Discussing the significance for drama history, in the British journal *Religious*, Mr. Gaster expressed wonder at the thought that this drama was "acted on the shores of the Mediterranean at about 1250 B. C.—fully seven centuries before the time of Aeschylus!"

The standard elements of Greek drama which he finds embodied in the ancient poem are: an opening prologue, originally choral; a combat between two principal characters, one being discomfited; a song of lament over the downed principal; a messenger describing the conflict, which happens off-stage; and a Deus ex Machina, who by divine intervention insures a happy ending.

The pantomime, which was current drama in Syria just about the time when Israelites were conquering Palestine to the south of it, is a religious tale of men and gods, the banishing of drought, and heaven-sent rain for the harvest. The poem has Semitic aspects which strengthen Mr. Gaster's theory that Ras Shamra traced cultural descent from Semites in the south of Palestine.

A second poem, which Mr. Gaster also regards as a drama, deals with "The Phoenician Legend of Daniel."

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E FIELDS

PSYCHIATRY

Mental Patients Are Still Chained to Their Beds

HOW NEW is the science of psychiatry and how fortunate the United States is in its modern mental hospitals is emphasized by a report to the current issue of the *American Journal of Psychiatry* by Dr. E. Lennard Bernstein, Arlington Heights, Mass., physician, describing the treatment of the mentally ill in Syria.

There, in a city of 200,000 inhabitants, Dr. Bernstein visited a white stone two-story house which serves the mental patients of all that district. In charge, is an Arab of the upper laboring class who, with his two children aged eight and six years, serves as superintendent, chief psychiatrist and factotum of the house.

Patients are assigned mattresses placed around the walls of darkened rooms where ventilation is poor.

Opposite each mattress, sunk in the wall, is an iron ring. All "bad" patients are chained in place with a leg in the ring.

Plumbing, Dr. Bernstein found, was lacking. A pail of water and a common drinking cup provided for the thirst of patients. They washed their hands and feet in another bucket.

Medical supervision was entirely absent except when the keeper thought someone ready for discharge. Then government authorities must approve his judgment. In fact, Dr. Bernstein learned that in the whole district there was no neurologist or psychiatrist.

The diet in this hospital consisted of the left-overs from the National Hospital for medical and surgical patients nearby. This was a bowl of mush three times a day with rarely, as a treat, some bread and was fetched by one of the patients.

Since the keeper's authority was completely despotic, it was "fortunate for the patients," Dr. Bernstein said, "that he was a kindly and patient person. Discipline was entirely based on his personal influence and his thin stick, but he rarely had to strike anyone."

The more Europeanized province of Lebanon is fortunate in having a 350-

bed modern psychiatric hospital, but this institution is the "only ranking psychiatric institution within a radius of almost a thousand miles" and draws patients from the upper classes of Egypt, Arabia, Persia and Turkey as well as from Syria.

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PHYSICS

Wind Tunnel Is Used To Classify Soil and Sand

IT IS common enough to think of wind tunnels as useful for study of better streamlining for airplanes, new high speed trains and fast motor cars. But did you know that scientists are now using wind tunnels to classify sand and soils as to the size of the particles in them?

In Pasadena, at the California Institute of Technology, scientists of the U. S. Soil Conservation Service and the Institute operate a wind tunnel for just this purpose and obtain a better separation of particles by size than they can do with ordinary sieves. Moreover, the method works better for the finer particle sizes; the place where sieves fail to yield best results.

The Caltech device sucks a stream of air through a twelve-foot tunnel. At the intake end the soil and sand mixture flows down into the air stream and is caught in the air currents. Heavy, larger particles fall quickly and are caught in special trays near the tunnel's entrance. The finer particles float more easily, travel farther and the finest the greatest distance of all.

Twenty different trays catch various particle sizes. The finest size corresponds to particles that can only pass through 250 mesh sieve. They have an average diameter of seven hundredths of a millimeter, or about 27 ten-thousandths of an inch.

Determining the particle size of soils and sands is an important fact needed for studies of soil erosion and conservation, either by wind erosion as in dust storms or in erosion by water. The size of particles, too, is important in studying the silting of lakes and water stored behind dams.

The Caltech device brings a new technique into the field which provides accurate data with a low cost for apparatus was built for about \$50 and requires only one laborer to operate it.

George H. Otto and Hunter Rouse, assistant geologist and associate hydraulic engineer at the laboratory, describe the new wind tunnel method in the current issue of *Civil Engineering*, journal of the American Society of Civil Engineers.

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ANTHROPOLOGY

Three Ancient Peoples In American Southwest

THREE distinct ancient cultures, now called the Anasazi, the Hohokam and the newly-differentiated Mogollon, are recognized in the remains left by the primitive peoples of the American Southwest who, in this desert-like environment, built up some of the most advanced aboriginal civilizations of the New World. These ancient civilizations are described by Dr. Frank H. H. Roberts, Jr., in a bulletin just issued by the Smithsonian Institution's Bureau of American Ethnology.

One group, the Anasazi, including everything hitherto referred to the Basket Makers and Pueblo builders, were scattered along the San Juan, Rio Grande, Upper Gila, Salt, and Little Colorado Rivers and through a good deal of Utah and eastern Nevada.

A second culture, the Hohokam, were mostly dwellers in the lowlands. Differences between these two are striking. The Anasazi buried their dead; the Hohokam practiced cremation. The Hohokam built rectangular, single-family houses of poles, brush and plaster, while the Anasazi progressed from these to the great stone "apartment houses" whose ruins may be seen today. The Hohokam dug extensive canal systems; the Anasazi depended mainly on flood water irrigation. The Hohokam domesticated the turkey; the Anasazi did not.

The third culture, the Mogollon, centered in the San Francisco and Mimbres valleys in southwestern New Mexico. These people practiced hunting to a far greater extent than the other two peoples. They first lived in rounded, semi-subterranean houses and gradually developed Pueblo type dwellings. They usually buried their dead, but there are some instances of cremation.

These three cultures progressed side by side for many centuries. Each was more or less influenced by the others and all three were influenced by the changing climatic conditions.

The Anasazi history may be dated from the timbers which show that one great dry period was responsible for a trend toward urban communities and another was an important factor in the abandonment of some of these centers. The greatest expansion and growth in one of the leading centers took place in a twenty-year period when conditions were favorable.

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