children—possessing attributes of the parent but having, in addition, some new, acquired characteristics.

While sulfanilamide has been effective in treating bacterial infections, said Dr. Crossley, some of the newer drugs, derived chemically from it, appear also to have usefulness in combatting the baffling virus diseases.

Hormone From Pituitary

For making the first isolation of a crystalline hormone from the anterior pituitary gland Dr. Abraham White of Yale University received the $1,000 Eli Lilly and Company Award in biological chemistry and Dr. White announced to fellow chemists the researches leading to this chemical feat.

The pituitary gland is the tiny body hanging from the base of the brain which leads the body's team of glands. The hormone Dr. White has isolated in pure crystalline form is the one which stimulates milk secretion.

Hope of discovering the chemical formula of this and a number of other hormones and of then creating them by chemical synthesis is very slim, Dr. White pointed out. The reason is that this and other pituitary gland hormones as well as insulin, the diabetic remedy, and the hormones of thyroid and parathyroid glands are protein in nature.

Proteins are extremely complex. Dr. White recalled that Emil Fischer, the great protein chemist, once calculated that the number of possible structural arrangements of a single protein might be as many as 10 to the 27th power. The chances of finding the correct arrangement out of so many possibilities seem remote.

Flame-Proofing Chemicals

Low-cost fire protection for America's homes should soon be more widely available through advances in chemical engineering revealed at the meeting.

Chemistry, by a new process, is now able to make cheaply and in vast quantities an acid from which can be made a unique flameproofing chemical. The chemical, known as ammonium sulfamate, does not change the appearance or feel of fabrics or paper impregnated with it. Moreover, it is not affected by dry cleaning methods so that it will safeguard draperies, upholstery and other household furnishings during their lifetime.

Parent raw material of the flameproofing chemical is sulfamic acid which while known for more than 100 years, has previously been made only by costly laboratory processes. Thus its flameproofing ammonium salt was too high-priced to be readily available to most people.

A method for the large scale production of sulfamic acid has now been devised and put into operation, Martin E. Cupery, chemical engineer of the E. I. du Pont de Nemours and Company, declared in his report to the chemists.

"Tailored" Gasolines

Synthetic, tailor-made gasolines which the petroleum chemical industry will soon be producing in quantities of 550,000,000 gallons yearly mark the fourth, and adult, stage of this major industry.

Dr. Per K. Frolich, director of chemical laboratories of the Standard Oil Development Company, Elizabeth, N. J., in an invited report described the growth of these "tailored" gasolines which are now giving airplanes a 15 to 30 per cent. increase in power take-off and climbing, or a 20 per cent. reduction in cruising fuel consumption when compared with the best previously available fuels.

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AERONAUTICS

New Zeppelin Is Described By American Airship Expert

Hindenburg's Successor Will Carry Only 40 Passengers Because Helium Has Less Lift Than Hydrogen

The airship, dinosaur of the air or future luxury liner of the heavens?

In Germany a long line of Zeppelins—more than 100—have gone aloft with such tragedies as the burning of the Hindenburg the exception, not the rule.

In America—and England, Italy and Russia—disaster has tagged lighter-than-air craft until Germany alone has an airship industry.

Germany has the airships. The U. S. A. has the helium that will hold them aloft without burning or explosion.

What does the coming of the new German airship add to airship design and practice? Commander Rosendahl, America's foremost expert, gives the answer in this exclusive article.

By Comdr. C. E. Rosendahl,
of the United States Navy

LIKE an aerial Phoenix, rising from the ashes of its predecessor, the newest German airship, the LZ-130, is now nearing completion in its Friedrichshafen hangar. This yet-unnamed air giant will be the first commercial airship in transoceanic service which will use helium as its buoyant, lifting gas.

The LZ-130 begins life with an important initial advantage over all its predecessors. It will never be a victim of a flaming hydrogen holocaust such as consumed the ill-fated Hindenburg. Despite some reduction in performance as the insurance premium for the use of safe helium, the fire hazard has been tremendously reduced by the use of non-inflammable helium gas.

In general design, dimensions, construction details and appearance the LZ-130 will be a duplicate of the Hindenburg for there was no fault to find with that air giant's structural form and its airworthiness. Major difference is that the LZ-130 will be lifted by helium instead of hydrogen. The accommodations are no less commodious than on the Hindenburg. In fact, they are superior in many respects.

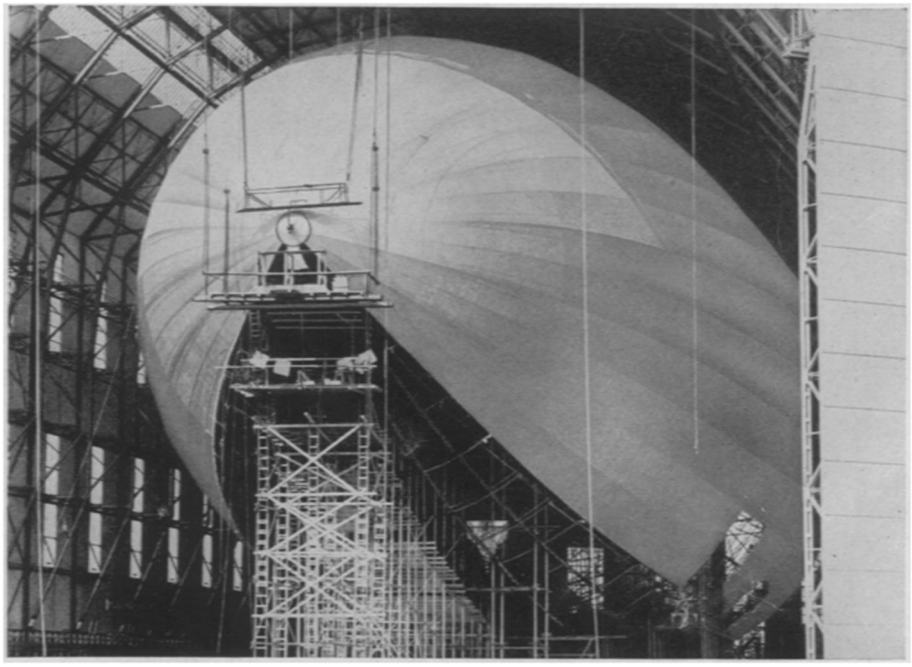
As the LZ-130 now lies in hangar she is 803 feet long, 135 feet in maximum diameter and, when inflated, will hold 7,063,000 cubic feet of gas that will provide a total lifting power of about 200 tons.

When she takes the air, four giant water-cooled Diesel engines will drive her at a maximum speed of 84 miles an hour and with a cruising speed of 78 miles an hour.

These engines will each develop 1,000 horsepower maximum and in normal operation will develop 800 horsepower. The engines are mounted in outside power cars, two on each side of the hull.

Through the LZ-130 run two long corridors, one at the bottom and one at the axis of the zeppelin. The hull is broken up into 16 compartments, or bays, which contain the separate helium gas cells that supply the lift. The inside coating of these cells is a special gelatinous material which has excellent gas-retaining properties.

The main corridor, along the bottom



GROWING

Viewed bow on is the nose of the German Zeppelin, LZ-130, sister-ship of the ill-fated Hindenburg. She is now nearing completion. At this point is attached the mooring cable. At a point corresponding to the bottom part of this picture the control cabin will be later attached.

of the airship, is the main load-carrying part of the structure. Along its length are located fuel and water tanks, supplies, spare parts, freight and baggage compartments and the crew and passenger quarters.

Three ladders from the lower corridor go up into the axial corridor which, likewise, runs the length of the airship from bow to stern. This corridor permits ready inspection of the gas cells.

The gas cells in shape may be thought of as giant doughnuts or fat balloon tires, for each of them has a small hole in its center through which runs the central corridor. Control valves on the cells permit the release of helium when needed in maneuvering; this set of valves is operated manually from the control car of the airship. Another set releases gas automatically as a safety valve.

Diesel Engines

Electric power for the entire airship is generated by two small Diesel engines in a special fireproof compartment along the main lower corridor.

The "nerve center," or bridge, of the LZ-130 is the small control car located forward on the outside and bottom of the ship. Here the actual operation and navigation of the airship occurs. The control car and the four engine cars communicate by a mechanical telegraph system. In addition there is a central telephone system connected with every vital part of the airship.

Normally the control of the ship is by hand, through a system of gears and cables running from the control car to the control surfaces. Electric robot power steering is also provided.

The radio room is located immediately above the control car. It is fully equipped for communication on both long and short waves, radio telephone and also has equipment for radio direction finding. In flight, the LZ-130 should be able to "reach" any ship in the North Atlantic by radio.

New Luxuries

The most notable change in the LZ-130 is in the layout of passenger quarters. The dining room, located in the center, is flanked on one side by a lounge, reading, and writing room and on the other side by a lounge, smoking room and bar.

Although the dining room is completely within the hull, ample visibility is secured by windows located along the promenades, which extend on both sides of the quarters. These windows, built-in at an angle to provide maximum range of vision, up and down, obviate the need for artificial lighting in the public rooms during the daytime.

By the use of ingenious aerodynamics, these windows are located in a zone of neutral pressure so that, although they may be kept open at all times, they create no drafts nor allow rain to enter.

Although the Hindenburg was originally equipped comfortably for 50 passengers, its facilities were soon expanded to accommodate 70 passengers because of the demand for transportation. On the new LZ-130 the passenger capacity will be for 40 passengers in North Atlantic service. This reduction is required partly because of helium's lower lift compared with hydrogen, and partly because of certain operating artificialities introduced while helium is relatively more expensive than hydrogen.

Daylight Cabins

The LZ-130 has 20 passenger cabins with services resembling those of steamers. In contrast to the Hindenburg, most of the cabins are daylight rooms, and four of them may almost be classed as "luxury" cabins, as they have the large slanting windows as in the public rooms. Each cabin contains an upper and lower berth, a washstand with mirror and hot and cold running water, writing ledge, chair and clothes closet.

For those who like statistics here are some on the LZ-130: Fourteen miles of girders; eighty miles of steel wire; 5,500,000 rivets; 33,000 square yards of fabric in the outer covering and 66,000 square yards of materials in the gas cells.

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Do not reduce more rapidly than one and a half pounds in a week, warns a nutritionist at the University of New Hampshire.

Stone Age men 30,000 years ago made the world's first musical instruments out of leg bones of swan, eagle, deer and other creatures.

GENETICS

Urges Breeding for Animals But Not For Human Beings

Secretary Wallace Considers That Emphasis on Show Points Parallels Discarded Ways of Corn Judging

BREEDING methods that have greatly improved the per-acre yield of corn will presently be applied to farm animals with equally beneficial results, Secretary of Agriculture Wallace prophesied in the Spragg Memorial Lecture, delivered at Michigan State College.

Secretary Wallace himself pioneered the large-scale application of Mendelian genetical principles to corn breeding, in a day when corn judging was based solely on the production of big, handsome individual ears, regardless of yield per acre. Though he was only a young man, he persisted—in the face of skepticism on the part of his seniors—in producing inbred strains of corn genetically pure for the particular high-yielding qualities he desired, and then crossing them with other pure lines.

This obtained the double advantage of combining the specifically desired qualities and at the same time endowing the offspring with the biological quality, still not well understood, known as hybrid vigor. Millions of bushels of corn are now being raised in the Midwest by the Wallace method, and the use of the hybrid strains is still spreading rapidly.

Breeding of farm animals, such as dairy cattle, egg-laying chickens, and meat animals, lags far behind corn breeding, Secretary Wallace declared. Selecting breeding stock on the basis of showring "points" is on a level with the old-fashioned methods of corn judging by individual ears. Performance tests based on egg-laying and butterfat-production records are somewhat better, but are still far short of certainty in selection and transmission of desirable qualities to offspring.

What is really needed, the speaker hammered home, is the selection of particular desirable qualities, the fixing of these in pure lines of sires and dams, and the uniting of these pure lines into high-production offspring by crossing. It will be the hybrid corn technique applied to animals.

Carrying of this pure-line method of breeding into application in human eugenics did not appeal to Secretary Wallace as practicable. Negative eugenics, the attempted elimination of undesirable traits by sterilization programs, he considers of dubious workability. Similar techniques failed when applied in early corn breeding, he pointed out.

For the much-advertised "race improvement" schemes of totalitarian states he had only scorn. We do not know what human qualities we want to breed for, he said, and it is highly improbable that any human community would submit to rigid mating control for the many generations necessary to produce results if we did know.

"It is definitely a false eugenic idea," Secretary Wallace continued, "to work toward some standardized preconception of the perfect man, such as the 'Aryan Race' of the Nazi mythology. No race has a monopoly on desirable genes and there are geniuses in every race. The fact that the dictator type of mind must inevitably oversimplify its problems, and attempt practical solutions, based on such false premises, can only mean that eugenic progress under a dictatorship will fail in the long run. Man does not live by bread alone, nor by genes alone . . . .

"No board of experts can tell a dictator how to breed a genius, nor indicate what kind of children our genius would have—if any. Were this possible we feel sure that a genius-breeding program by decree (even a decree buttressed by 99.75% of the 'electorate') could only offer the kind of environment from which the best inheritance would bear only bitter fruit.

"If the eugenic outlook in democracies is today as bad as some eugenicists feel, the solution is thus seen to lie not in an appeal to dictatorship but in the development of a kind of social environment in which superior individuals feel that life has values and possibilities which it is a privilege to pass on to one's children."

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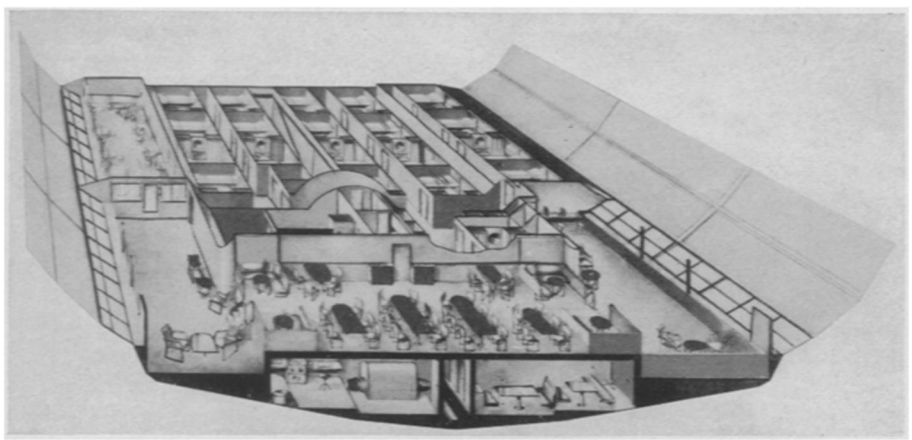

INTERIOR

Artist's drawing shows the arrangement of public rooms and passenger quarters on the new German Zeppelin, LZ-130. In the foreground is the galley, the large dining room and the lounge, bar and smoking room. At the top right of the picture are the "luxury" cabins with outside windows.

METEOROLOGY—AVIATION

French Steamer In Atlantic To Supply Weather Data

THE FRENCH steamship S. S. Carimaré will be stationed in mid-Atlantic until June to furnish weather data for trans-Atlantic flying and for regular maritime purposes, it is announced at the Hydrographic Office of the U. S. Navy.

The service to be conducted by the steamer will be similar, it was stated, to that provided by the S. S. Jacques Cartier in the past. Ships are asked to radio weather reports to the Carimaré at midnight, six a. m., noon and six p. m. Greenwich Mean Time.

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Geysers have rather brief careers compared to most geological phenomena.