

CHEMISTRY

Mixture Detects Presence of Traces of Carbon Monoxide

► **DANGER** from carbon monoxide poisoning can be avoided by use of a simple, relatively inexpensive method developed by the National Bureau of Standards that will indicate by color as little as one part of the dangerous gas in 500,000,000 parts of air.

It was developed for determining the amount of carbon monoxide within aircraft, but can be used to equal advantage in buses, automobiles, garages, furnace rooms, and other places where this gas may lodge from incomplete combustion in engines or stoves.

The color indicator used in this new carbon monoxide detector is a yellow silica gel impregnated with a complex silico-molybdate compound and catalyzed by means of palladium sulfate. This mixture is placed in a five-inch glass tube the size of a lead pencil, and air to be tested forced through. The yellow indicator turns green if carbon monoxide is present, the degree of green indicating the amount of the poisonous gas.

In use the sealed ends of the glass tube are broken open and one end of the tube is inserted in an ordinary two-ounce rubber aspirator bulb equipped with a special control valve. The bulb is squeezed once, then the color of the gel is compared with a set of standard color chips. A test can be made by an untrained person in about one minute.

Science News Letter, December 14, 1946

ARCHAEOLOGY

Western Planned Cities Date Far Back in History

► **PLANNED CITIES**, such as Washington, are an old development in the Western Hemisphere, archaeologists have discovered. Peru had carefully laid-out cities with geometrically patterned streets before the Incas, who were conquered by the Spaniards.

Scientists of the Institute of Andean Research this summer mapped 300 sites of early peoples in the Viru Valley of northern Peru, revealing portions of a story of 3,000 years of human culture in the small fertile valley.

Dr. Gordon R. Willey of the Smithsonian Institution, who specialized in the settlement patterns of the early Peruvian groups, says that the 300 sites studied so far are probably about one-fourth of those in the valley.

Human beings have lived in the Viru

valley from about 1,000 B. C. to the present, with eight distinct cultural periods up to the time of the Spanish conquest.

The planned cities, which did not appear in Europe until well into the metal ages, have been unearthed in northern Peru among the remains of a culture before the Incas.

In these early cities, there were places assigned for temples, other public buildings, storehouses and dwellings. Largest of the cities was Chanchan, by far the largest city in the New World before white men came. Dr. Willey believes these planned cities were developed by a culture in which everybody knew his place and lived according to a prescribed pattern.

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INVENTION

Light Beams Help to See Down Inside Beer-Cans

► **INSPECTING** the insides of bottle-necked beer-cans or other opaque containers with small openings seems a baffling job. Yet it must be done before filling, to detect loss-causing faults. I. W. England of Passaic, N. J., and W. F. Punte of Syracuse, N. Y., have solved it by projecting light beams obliquely into the neck, while immediately above these lamps is a lens train that throws an image of the can's interior onto a screen which the inspector watches. Automatic mechanism feeds the cans into position, with a momentary pause to let each be viewed.

Patent 2,411,991, issued on this invention, has been assigned to the Continental Can Company.

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CHEMISTRY

Formaldehyde Is Made From Air and Natural Gas

► **AN IMPROVEMENT** in the process of manufacturing formaldehyde, important as a disinfectant and as an ingredient of plastics, out of air and natural gas, has been made by Dr. Thomas K. Sherwood of Wellesley, Mass. By raising the working temperature, he completes the process in a small fraction of the time formerly required. The formaldehyde vapor is then condensed by contact with a cool formaldehyde solution. Patent 2,412,014, covering this process, is assigned to Godfrey L. Cabot, Inc., of Boston.

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IN SCIENCE

ARCHITECTURE

Good Adobe Keeps Houses From Becoming Mud Pies

► **DO YOU THINK** you might beat the housing shortage by throwing up an adobe home in the style of California and the Southwest?

You'd better think twice or you might find yourself with a mound of mud after a few good rains.

This is the synthesis of advice on adobe construction given in a bulletin of the University of California College of Agriculture.

The right kind of adobe will make a good house, the bulletin says. But tests should be made to determine the characteristics of the soil.

Adobe houses can be made of bricks, rammed earth, or poured adobe or mud concrete. Costs are about the same as for a wooden home of the same size, though this can be cut by the builder using his own labor and eliminating decorations.

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ORDNANCE

Atom Bomb Does Not Harm Weapons of Many Types

► **ATOM-BOMB** blasts will not injure weapons of many types, ranging from tommy-guns to tanks, it was demonstrated by the tests at Bikini. Final evaluation of the effects of the explosions on Army materiel exposed on the decks of some of the target ships is given by Lt. Col. S. F. Musselman in *Army Ordnance* (Nov.-Dec.).

Many of these weapons, which showed no permanent effects from either concussion or radioactivity, have already been returned to arsenals, whence they will be issued to troops for regular use. Most damage from concussion was sustained by vehicles such as jeeps and tanks, which were securely bolted to the decks and hence could not "roll with the punch".

Damage from the underwater explosion was mostly salt-water corrosion, not essentially different from that shown by metal after any ordinary kind of salt-spray exposure.

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E FIELDS

PHYSICS

Tiny Radio Antennas Aid Navy Communications

► TOM THUMB radio antennas are being constructed and tested in laboratories at the University of California in an effort to improve naval communications.

Tiny, scale models of transmitters of all different shapes are "given the works" in the electronics research laboratory. Promising models will be built full size and given full-dress tryouts aboard naval vessels.

Thomas McFarland, University engineer in charge of the project, says that naval communications have been seriously handicapped by the presence aboard vessels of large numbers of transmitters which interfere with one another; and by construction characteristics of naval architecture.

For example, some transmitters can send only in one direction, or in a seriously restricted arc from the ship. Thus a ship might have to travel in a certain direction for a specific antenna to be of any use.

Mr. McFarland indicated that research may develop transmitters which will overcome some of these difficulties, and that changes in ship design might be needed to solve the problem finally.

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ENGINEERING

Plenty of Liquid Fuels To Come From Coal

► THERE WILL BE plenty of gaseous and liquid fuels available in America for a thousand years or more, the American Society of Mechanical Engineers was told by Arno C. Fieldner, chief of fuels and explosives of the U. S. Bureau of Mines.

These fuels may not be petroleum products, however; they will be derived from coal and lignite, of which there are abundant reserves. Production from these sources will increase as the reserves of petroleum and natural gas approach exhaustion.

Coal and lignite can be converted into gaseous and liquid fuel, he said, and have been so converted for many years. Processes and equipment for this pur-

pose have been developed, and the costs are known. In recent years, in Germany in particular, processes have been put into commercial operation for the manufacture of liquid fuel from coal and from lignite.

Mr. Fieldner estimated the known fuel reserves of the United States at an energy equivalent to 2,600,000,000 tons of bituminous coal. Approximately 55% of this solid fuel is high-volatile bituminous coal, 23% subbituminous coal, 19% lignite, 2.5% low-volatile bituminous, and 0.5% anthracite.

A declining supply of petroleum can be supplemented also by alcohol from the fermentation of vegetable matter, conversion of natural gas by the gas-synthesis process, and the distillation of oil shale.

The cost of fuels from coal and lignite will be greater than the present cost of petroleum and natural gas, he said, but future developments in the more efficient utilization of fuels should go far in offsetting the cost of conversion.

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AERONAUTICS

Railway Cars May Replace Landing Gears on Planes

► FLAT RAILWAY cars on tracks on airfields are suggested to replace the present built-in-landing gears on planes.

A powered railway car operating on a track several miles long could be used for take-offs also, Lewis A. Rodert, of the National Advisory Committee for Aeronautics, told the Society of Automotive Engineers in Chicago.

Explaining that the attainment of higher air travel speeds calls for eliminating such current handicaps as conflicts in design, equipment, and technical requirements for flying, taking off, and landing, he directed attention to the possibility of eliminating the landing gear of long-distance planes and of substituting flat fuselage bottoms suitable not only for landing on moving railway cars, but for protecting passengers in case of forced emergency landing.

Launching would be accomplished by accelerating the car, the plane being released when climbing speed is reached. In landings, the plane would follow radio range beacons and glide path control equipment to land on the fast moving car which would be brought gradually to a standstill after the plane was aboard.

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MEDICINE

Baby Blood-Typing Is Best Identification

► COMPLETE TYPING of new-born babies' blood, with 360 blood varieties available for identification, is advocated as a replacement of the foot-printing now common practice to prevent tragic mix-ups in maternity hospitals. This idea is offered in the *Journal of the American Medical Association* (Dec. 7) by Dr. Malcolm A. Hyman of the Jewish Hospital of Brooklyn.

The 360 different identifiable kinds of human blood are made possible by a combination of the various blood types, the agglutinin P (plus and minus), and ten Rh-Hr types.

Dr. Hyman advocates collecting a little blood from the new-born infant's umbilical cord, putting it in a corked tube, and attaching this to the mother before the child leaves her side for its first bassinets. If any doubt of the baby's identity should subsequently arise, a new sample could be drawn and compared with the original one.

Dr. Hyman points out that babies' footprints, as made at present, usually become smudged and unrecognizable in a relatively short time. In any event, by the time the child is a month old the footprint has changed completely and is useless for identification purposes. The chemical pattern of the blood, on the other hand, is unchanging.

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PHARMACOLOGY

Pharmacists Will Take Sting Out of Iodine

► PHARMACISTS are going to take the sting out of tincture of iodine, a famous disinfectant for cuts for more than a century.

The new edition of the Pharmacopoeia of the United States of America, which will become official April 1, 1947, has dropped the familiar 7% tincture of iodine in favor of a 2% mild tincture. Just as efficient as an antiseptic and germicide, the milder tincture has the advantage of not retarding healing by destroying tissue, a frequent fault of the stronger remedy.

The Committee of Revision of the Pharmacopoeia declares, "Every druggist in the country should be familiar with this change." You will agree if you recall the sting of the old iodine disinfectant.

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