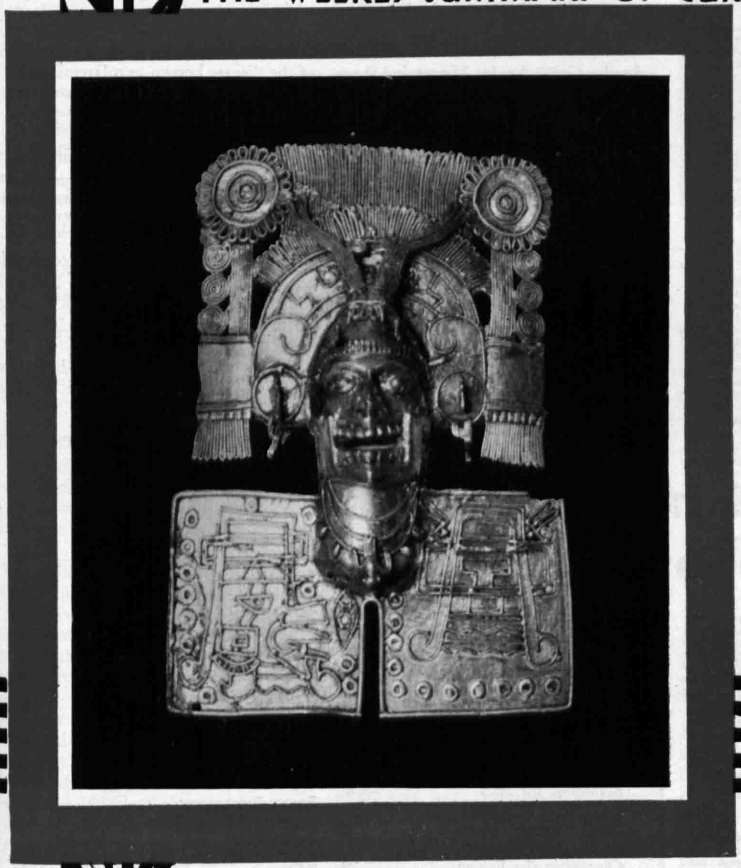
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JANUARY 30, 1932

From the Breast of a Tiger Knight

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A SCIENCE SERVICE PUBLICATION

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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? DO YOU KNOW THAT ?

The newest water-tight doors on ocean liners are controlled electrically from the navigating bridge and can be closed throughout the ship in half a minute.

Before coffee became the beverage known today, the berries were first used as food, and later were prescribed as medicine.

Experimenters at the University of California are seeking a successful method of sterilizing fruit juices by electricity.

In the Great Smoky Mountains there is a giant grapevine five feet in diameter at a point 12 inches above ground.

More than 90 per cent. of the dolls sold in the United States are now made within the country.

A synthetic carpet fabric has been produced by fixing unspun goat hair vertically in a rubber base, which is vulcanized to a rubber-coated backing.

A new gaseous motor fuel, which drives a truck and refrigerates it as well, has been developed for use in commercial cars.

In 120 years of immigration, the United States has received the greatest number of people from Germany, next coming Italy, and Ireland.

Four to five tons of ashes per minute can be removed from powerhouse pits by a hydraulic jet and sent in a stream to a suitable place at a distance.

Iodine is being extracted from the water in Italian wells, thereby making Italy almost independent of imported iodine.

The coyote is found to be a carrier of the disease known as tularemia, which attacks rabbits and is transmitted from them to human beings.

On passenger liners now being built, the weather—indoors at least—will be kept regularly "fine" by means of air-conditioning apparatus.

A German firm making photographic accessories has produced a filmpack slide with a locking device, which makes double exposures impossible.

The world's largest carpet has been made in Czecho-Slovakia for a New York hotel.

WITH THE SCIENCES THIS WEEK

Science Service presents over the radio, an address

EVENING PRIMROSES AND EVOLUTION

By Dr. George H. Shull, Professor of Botany and Genetics at Princeton University.

Friday, February 5, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ARCHAEOLOGY

Discoverer of Mexican Tomb Reveals Its Strange Treasure

Six Dead Warriors, Richly Ornamented, Greeted Entrance Of Explorers at Monte Alban, says Chief Archaeologist

By ALFONSO CASO

Archaeologist of the National Museum of Mexico and discoverer of Monte Alban prehistoric tomb.

In this exclusive dispatch, Sr. Caso gives the first authentic details of his discovery that promises to solve the mystery of an unknown prehistoric American race that buried its warriors surrounded by gold, precious stones and carved human bones, rivalling in splendor the tombs of Egypt.

FOR DAYS we had been excavating at Monte Alban, the ancient fortress-city, now a mountain of ruins, near Oaxaca City in southern Mexico. At last our picks and shovels uncovered the entrance of the ancient Mixtec Indian tomb that was to prove so interesting and rich in treasure and archaeological evidences.

We entered the tomb through an antechamber approached by a pair of steps. As we made our way within we found that there were two rooms, separated by a portal. The first of these rooms has a flat ceiling, but the second is a gabled vault with ceiling like an inverted V.

There we saw dead warriors, six of them, seated around the walls, jewel-covered and ornamented with gold and other precious things. The long years had dealt severely with them. We found that their skeletons had practically disintegrated during the many decades since they had been placed there.

Near them were many extraordinary objects—gold, silver, copper, jade, turquoise, shell, pearl, coral and other materials.

These precious articles were immediately removed under guard to the vaults of the Bank of Mexico for safe-keeping.

Human bones, beautifully carved, were found in the tomb, and promise to be of the greatest scientific interest. They are carved with a technique not surpassed by fine Chinese work on ivory. The various engravings upon these portions of human skeletons picture happenings of history. They also have worked upon them details from the ritual calendars used by these ancient Indians.

Thus the carved bones are veritable leaves of books, books of human bone used to record information important to this ancient race.

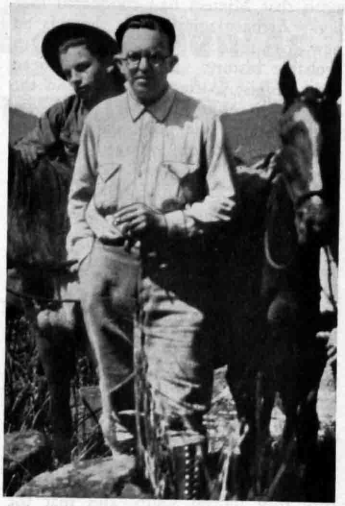
A sacred mask that represents the Indian god, Xipetotec, is one of the ornaments of gold.

A diadem of gold, breast ornaments of gold, bracelets and necklaces, all of gold and beautifully worked, were among the treasure of the tomb.

An unusual bowl of rock crystal and several beautiful alabaster vessels were in the mass of treasure. Many pearls were also found, some of unusual size.

A human skull, richly encrusted with turquoise and shell, was probably some ancient warrior's trophy. When it was found it had a flint knife resting in the hollow of the nose.

Those who explored this ancient tomb with me were Martin Bazan, Juan Valenzuela and my wife.



ALFONSO CASO

—the Mexican archaeologist who engineered what is probably the greatest archaeological find in American history.

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ARCHAEOLOGY

Mixtec Warriors in Treasure Tomb May Have Been Invaders

THE MIXTEC warriors buried with their fabulous gold and gems in a recently discovered tomb of the ancient Indian city of Monte Alban, may have been intruders. This is what archaeologists now suggest, for the dead warriors were probably Mixtec, while the city where they were was always considered Zapotec.

Mixtecs and Zapotecs now live together in the southern Mexican state of Oaxaca where the tomb was found. They speak related languages, and together with about half a dozen other Indian groups form what scientists call the Zapotec linguistic family.

Mixtecs and Zapotecs differ in customs and language from their southern Mayan neighbors who were once the most remarkable nation in America. They also differ from their spectacular Aztec neighbors to the north, although all American Indians are of the same great race.

The Mixtecs had as their great city Mitla, "place of the dead," not many miles from Monte Alban. Mitla lies in a sunburned cactus-covered plain. Its many beautiful palaces and temples of geometrical stone mosaics stand on low wide terraces that hardly rise from the ground.

The Zapotec city of Monte Alban, on the other hand, is built on platforms of a mountain top. The natural mountain profile was strikingly changed by the hand of man. Mitla was a living city at the time of the Spanish Conquest, but Monte Alban on its mountain top was already dead and forgotten.

The presence of Mixtec warriors' graves in Zapotec Monte Alban may

mean that Mixtecs had conquered that city. Archaeological work there is so new that little is as yet known of its probable history. Before the Mexican archaeologist, Alfonso Caso, found the sensational Mixtec treasure tomb, he had unearthed the giant stairway of a terrace that had been enlarged three different times. This could indicate three different epochs of the history of the city.

Mayan in Style

Carvings of human figures on stone in Monte Alban are very Mayan in style. Zapotec numerals are also written as in Maya. Many archaeologists believe the Zapotecs learned this from their Mayan neighbors, but others think the process may have been the other way around. Alfonso Caso, who has already made a beginning in classifying Zapotec writing and calendar signs, thought the Mayas might have lived in Oaxaca before they moved south, and that the Zapotec calendar may be based on an earlier form of the Mayan one.

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ARCHAEOLOGY

Origin of Mayan Calendar Sought in Monte Alban

THE FABULOUS TREASURES of ancient Indians which the Mexican archaeologist, Alfonso Caso, has found in a tomb of Monte Alban, are not the greatest treasures for which he is seeking.

When Sr. Caso started the excavations in October, he said that he expected to find a tomb of kings or priests in Monte Alban. But he also expected to find new information on the Zapotec calendar, which would be of great scientific importance.

Before starting his excavations, Sr. Caso had already gathered archaeological materials from Mexican, American, and European museums for a comparative study of Zapotec writing. From these studies he has deduced certain principles of the hieroglyphic system the Zapotecs used.

Sr. Caso believes it possible that the Mayan calendar, the most notable achievement of any native American civilization, orginated in Oaxaca, the state in which Monte Alban was a great city.

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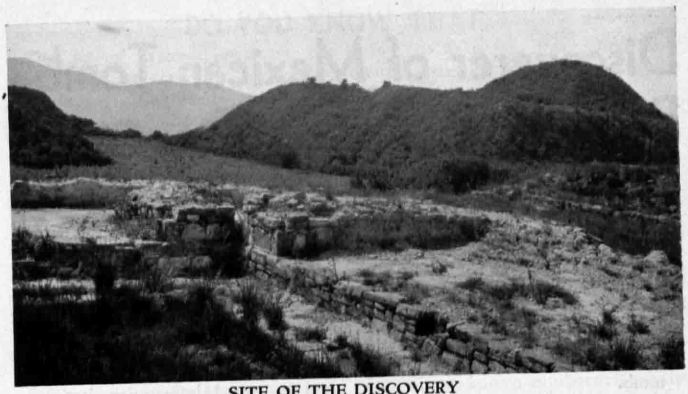
Blueberries in the United States are grown chiefly on wild or semi-wild lands.



SITE OF THE DISCOVERY

Ruins of buildings in the ancient Zapotec City of Monte Alban, Oaxaca, Mexico, where the treasure tomb of Mixtec warriors was found.

ARCHAEOLOGY

Finding Cache is Fabulous Treasure Tale Come True

FABULOUS treasure tales are as common in Mexico as in lurid fiction. But the recent finding of a real cache of Indian wealth was nevertheless a surprise, and one of the most unusual discoveries in American archaeology.

It recalls the tales of gleaming golden cities the Conquistadores sought, and the hidden Indian wealth they never found. Mexican archaeologists stated months ago that their digging in Monte Alban would prove sensational, but they themselves hardly expected the riches disclosed in a warriors' tomb in that ancient southern mountain city.

Treasure hunts have been without number in Mexico. An American stock company was even formed, once upon a time, to look for the fabulous wealth the legendary Plumed Serpent God, Quetzalcoatl, dropped in his mythical flight from the unknown city of Tula.

Part of the treasure of the Aztec Montezuma was actually once in Spanish hands. But the soldiers of Cortes dropped it in the mud and water in their flight over the lake at Tenochtitlan, as Mexico City was called in pre-Spanish times. When Cortes made his victorious return in 1521, he found the rest of the Aztec treasure gone. Indians were said to have hidden it in the meantime. Cortes burned the feet of the Aztec prince Cuauhtemoc, "Fallen Eagle," to make him talk, but he would not reveal the treasure's whereabouts. Other tortured Indian nobles groaned, but Fallen Eagle, with his smoking feet, made his famous retort to them, "And do you think mine is a bed of roses?" Cortes killed him, but the treasure was never found. So much Mexican treasure is lost that Mexicans jocosely say that if only part of it were found, it would pay the national debt.

The find at Monte Alban sounds like fiction but for the fact that strange things of gold and gems now lie in the vaults of the National Bank. Monte Alban always had a glamorous reputation. When that southern land of Oaxaca was a vassal state of Montezuma's empire, the natives sent taxes of gold and jade.

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ARCHAEOLOGY

Mexican Law Forbids Sale Of Monte Alban Valuables

ALTHOUGH extremely valuable treasures have been found in Monte Alban, according to Mexican law they are not for sale or transfer out of the country. They are considered not as of cash, but as of scientific value, and as art and historical treasures belonging to the nation.

Such laws are still comparatively new in Mexico, for at all times but in the

recent past, Mexico has been publicly pilfered of its most precious treasures of history and art. Beginning with the Conquistadores, Indian objects worked in gold were made into bullion and shipped away in Spanish galleons, sometimes to be robbed, or sunk by pirates. In earliest colonial times Indian temples and palaces were dismantled, and the stones used for Spanish houses and churches. Archaeological tigers' heads are seen as gargoyles on Mexican colonial houses, serpents' jaws and heads as decorative motives, and lintels of temples as doortreads of Christian churches.

In the last one hundred years, since American antiquities have begun to stir scientific interest in the world, Mexico has been systematically robbed of the best specimens. Temple walls were ruined to extract some carving or figures for some American or European museum. Certain foreigners in recent years had established lucrative businesses in Mexico, collecting archaeological objects to ship out of the country. In the last fifteen years that has been illegal, and the Mexican government has watched its border points with care, examining all baggage leaving the country. Idol-running nevertheless is still an exciting game below the Rio Grande, with government officials preventing it as best they can.

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ARCHAEOLOGY

Monte Alban Treasure May Set Jewelry Style

See Front Cover

THE proud inhabitants of Oaxaca, in whose vicinity the Mixtec treasure tomb was found, think they are going to set the world's jewelry styles. A casual glance at the ornaments and trinkets reveals that archaeology has already influenced modern jewelers.

One of the most beautiful objects found in the Mixtec tomb of Monte Alban is a carved and filigreed breast ornament of gold. The human head with its enormous headdress represents a "tiger knight," Senor Caso, discoverer of the tomb, said. The fierce gold fangs of the animal are bared. Among the ancient Mixtecs, Aztecs, and other Mexican Indian groups, there were orders of knighthood, as there were in contemporary medieval Europe. Most famous were the tiger and the eagle knights. These American knights wore masks of the symbolic animal of their order, and the man's head protruded from between the animal's jaws.

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ARCHAEOLOGY

Monte Alban Long Seen as Important Archaeological Site

ANCIENT Monte Alban, in southern Mexico, where warriors' graves have just yielded treasures that recall the riches of Egypt's tombs, has long been looked on by scientists as one of America's most important archaeological sites.

Its riches have been known, for in 1902 a non-scientific expedition took treasures of jade and gold from a royal grave. An earthquake in 1927 split an ancient tomb and spilled jade.

"White Mountain"

When the Spaniards conquered Mexico in 1521, and went south to Oaxaca, they found Mixtec and Zapotec Indians living in Mitla, a city famous for its ornate palaces of stone mosaics and brilliant paintings. But Monte Alban, not many miles away, was ruined and forgotten. Indians in Mitla did not know who built it, or when or why it was deserted. The Spaniards called it Monte Alban, "White Mountain."

It is built on the crest of a ridge some 2,000 feet above rich green valleys, and over 6,000 feet above the level of the sea. It used to be a pleasant morning's jaunt on horseback along a narrow mountain path, but since 1931 a road has led to the summit and the trip is now one of only twenty minutes. The modern town of Oaxaca is a blur of pink and white and green below.

Ancient Monte Alban was literally chiselled out of the backbone of a mountain. The natural surfaces were made by the unknown builders into terraces of different levels. Sides of terraces were walled with stone, and stairways led up sheer declivities. It was well fortified.

The city is a maze of symmetrical terraces and sunken plazas, upon which minor terraces and pyramidal substructures stand, crowned by temple and palace ruins. These buildings are now stumps, and centuries of earth and vegetation veil them.

Monte Alban is intriguing to archaeologists. It recalls both the Mayan cities to the south, and Indian cities of central Mexico, like Teotihuacan, far to the north of Monte Alban.

The Mayan people were in their time the foremost in America, but their origins are buried in mystery. The mystery seems to have some of its roots in Monte Alban, to judge by certain signs. The inverted V-shaped Mayan arch is found in tombs of Monte Alban, and so are sentinel stones whose human figures and hieroglyphs are carved in almost Mayan fashion.

The excavations at Monte Alban, conducted by Alfonso Caso, archaeologist of the Mexico City National Museum, mark the first scientific work at that ancient city. They mark a new step, too, in Mexican scientific annals, for it is the first time archaeological work is carried on in that country by private local enterprise.

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ANCIENT FINERY

Among the jewelry of the treasure tomb just found in the ancient city of Monte Alban, in Southern Mexico, is a strand of thirty-one hollow gold beads. An ornate lavalliere, made in six pendant pieces, is filigreed and carved, and terminates in drop-shaped golden bells. Another article is the golden handle of a fan still held by the crumbling fingers of a skeleton. There is a necklace of seven golden shells from each of which dangle drop-shaped golden bells. The jewelry was buried for an unknown number of centuries in the Oaxaca tomb, but the art that made it is not lost. Modern Mexican Indian gold and silver jewelry recalls these ancient styles.

ASTRONOMY

Reforming the Stars

In February Skies, Finest of the Year, are Kings and Heroes Whose Names Have Resisted Radical Changes

By JAMES STOKLEY

TO FEBRUARY evenings there comes what is probably the year's finest display of stars. This year the second month brings no eclipses of sun or moon, no meteor showers, nor any other of the more sensational sights of the heavens. But with Orion, most magnificent of all constellations, shining high in the south; with Canis Major, in which is found Sirius, brightest of stars, close behind; with Taurus and Gemini and Auriga nearby, not to mention Leo and Canis Minor, there are certainly glories to satisfy anyone.

Look first at Orion. A little to the west of the south point, it is about half way from the horizon to the zenith. The three bright stars in a row, that form the warrior's belt, provide a ready means of identifying this constellation. And now we can trace out the rest of the figure. Of course, to us moderns it is hard to see any resemblance whatever between the arrangement of the stars and a man wearing a belt to which is attached a sword, his left foot upraised as if stepping on something, both arms uplifted, with a lion skin thrown over the left one and a club in the right hand, his face turned towards Taurus, the bull, which he is about to smite. Even if the three stars in a row do look something like a belt, whence came the other details? It is true that the constellation figures date from remote antiquity, and it is also true that many thousands of years ago the stars, which are continually moving, were arranged very differently from what they are now. By tracing their motions backwards, we can see how they were arranged in the past; but even then they bore no resemblance to the mythological figure.

Though they have long ceased to have any scientific significance, and astronomers nowadays are most likely to designate a star by a number in a catalog rather than by any reference to the constellation, these old figures still have considerable historical interest, and the beginning student of the stars can do worse than to know their outlines. Take Orion, for instance. There is a bright star, of a somewhat ruddy hue, above the belt, and another, only slightly fainter, an equal distance below. The upper one is called Betelgeuse, the lower, Rigel. West of Betelgeuse is another bright star. This is Bellatrix.

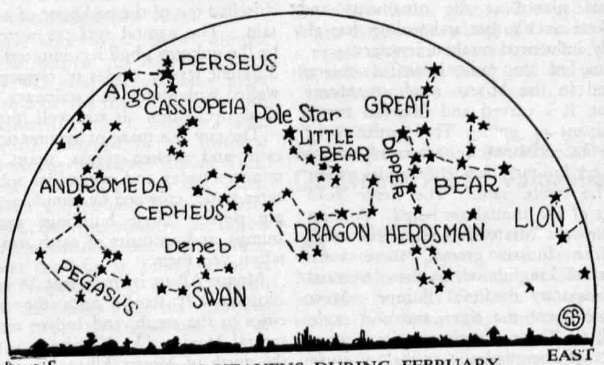
Luminous Lion Skin

Continuing westwards along the line connecting Betelgeuse and Bellatrix, we come to a row of fainter stars, at right angles to the line. Another row of fainter stars extends upwards from Betelgeuse, and still another downwards from the easternmost star of the belt. Now we have the main parts of the giant warrior, whose body is turned towards us. Betelgeuse is his right shoulder, Bellatrix his left. The row of faint stars to the west is the lion skin, and the row extending upwards from Betelgeuse the upraised arm carrying the club. Rigel forms the uplifted left foot, and the row of stars from the belt are the sword. The right foot wanders off among some very faint stars to the south, while the head (doubtless an unimportant detail for a warrior!) is accounted for by some faint stars just above Bellatrix.

Orion has not always been recognized as a warrior, however. Nothing is immune to the ruthless hand of the reformer, not even the stars, as was clearly demonstrated in the 17th century. In the year 1603 a lawyer of Augsburg, Johann Bayer by name, published a famous star atlas in which he introduced the system of designating stars by Greek letters, followed by the genitive case of the Latin name of the constellation, a system that is still in use. At the Augustinian monastery in Augsburg there was a monk, Julius Schiller, who was an intimate friend of Herr Bayer. Evidently Bruder Schiller felt that it was wrong for a Christian people to perpetuate pagan deities in the heavens, so he proceeded to prepare a set of Christian constellations, using the star locations as determined by his friend.

The result of this labor appeared in 1627 with the publication of a work entitled "Coelum Stellatum Christianum," a book that is now exceedingly rare. In 57 beautifully engraved star maps, he depicts an entirely new set of constellation figures, and Orion has been transformed into St. James. The "belt" stars form the saint's girdle, but the lion skin has metamorphosed into an olive branch, while the arm with the upraised club has become his carpenter's tools, placed in the background.

Other constellations were changed just as radically. The twelve signs of Zodiac, as was logical, became the twelve apostles, with Aries, the first, becoming St. Peter. In one or two cases, only a slight change was necessary. Thus, Corona, the crown, a constellation of faint stars visible in the summer sky, remained a crown, but became the Crown



NORTHERN HEAVENS DURING FEBRUARY

Whatever the Big Dipper contains should be evident this month for that constellation is tipped way over. Nevertheless, the two outer stars of the dipper's bowl point faithfully to the star keeping watch over the North Pole.

THE GREAT WARRIOR

Occupying the center of the southern stage is familiar Orion, most magnificent of constellations. Above Orion are the twin stars, Castor and Pollux, brightest members of the constellation of Gemini. Far to the right swing the famous Pleiades, subject of endless legend.

of Thorns. The ship Argo, which is only visible from southern countries, became Noah's Ark. But one ship was insufficient for him, so he made Ursa Major, with the great dipper, into St. Peter's ship.

Fortunately, perhaps, these Christian constellations were never widely adopted, although others made similar attempts later. One was by Wilhelm Schickard, who taught Hebrew and mathematics at the University of Tübingen, and another by Philipp Harsdörfer, a councillor of the city of Nürnberg. Even more ridiculous was a suggestion made by Erhard Weigel, professor of mathematics at the University of Jena, later in the 17th century, to replace the old constellations by the arms of European royal families!

But Orion still remains with us, and still holds his club on high, as he is about to resist the charge of the Bull, Taurus. To the astronomer, studying these stars with telescope, spectroscope, interferometer and photographic plate, there is a greater significance to these orbs about which the ancients wove such fancies. In the stars of Orion's sword, for instance, there is a faint patch of light that can just be glimpsed on a clear dark night, away from the city lights. Through even a small telescope, this becomes a beautiful glowing cloud. Long exposure photographs taken through the world's greatest telescopes show a mass of detail, and the spectroscope reveals what it is—a cloud of glowing gas. Just why it should glow like this no one can say, but it seems to be excited by some sort of radiation from the trapezium, a group of faint stars in the heart of the nebula.

This nebula is so distant that its light takes 600 years to reach us, travelling along at a rate of six trillion miles every year. It is so large that a beam of light would take more than three years to cross it. Yet this distance is not so large, nor the size so great when it is compared with another famous nebula, the great nebula of Andromeda, best known of all the spiral nebulae. The spirals are vastly different from the gaseous nebulae, of which the one in Orion is the typical example. The spirals are actually galaxies of suns, similar to our own galaxy, of which the sun is a small unit.

Enormous Betelgeuse

Perhaps equally interesting is the star Betelgeuse, for it was the first star to have its diameter measured directly, by means of the interferometer invented by the late Prof. A. A. Michelson of the University of Chicago. Betelgeuse is 215 million miles in diameter, so vast that if it were a hollow shell, the sun could be placed inside, and there would still be room for Mercury, Venus and the earth to revolve in their usual orbits.

Several other stars have been measured since with the same instrument, and some found even larger. And now a greater and improved interferometer has been constructed at the Mt. Wilson Observatory, and before long, still other star measurements may be expected, of bodies beyond the reach of the older instrument.

Among the numerous other interesting objects in Orion is one of the best known "dark nebulae," clouds of dark matter visible only as they are silhouetted against a bright background. This one is just south of Alnitak, the easternmost star of the belt. It is sometimes called the "Horse's Head," from its shape. Unfortunately, only a long-exposure photograph through a great telescope will reveal it.

Besides Orion, the February evening sky brings us Taurus, already mentioned, above Orion and to the right. The red star Aldebaran is the most conspicuous object in this group, and it forms the bull's eye. To the right of Aldebaran is a cluster of somewhat fainter stars. These are the famous Pleiades, subject of much legend. Above Orion is the constellation of Gemini, the twins. Their names are Castor and Pollux, and they are the two bright stars in this group. Pollux is the brighter star of the two, the one to the southeast. South of Pollux is Canis Minor, the lesser dog, with the brilliant Procyon to mark it. And still farther south, brighter than any other star in the sky, is Sirius, the dog-star, marking Canis Major.

Below Gemini, to the east, is the familiar sickle, in Leo, the lion, but between these two constellations is Cancer, the crab. Cancer contains no extremely bright stars, but at present it is the abode of the planet Jupiter, which shines with a steady brilliance. Nearly overhead is a brilliant star, Capella, which marks Auriga, the charioteer. Below him is Perseus, and below Perseus is Andromeda, now about to disappear behind the western horizon. Directly west, in the early evening, can be seen the planet Venus, which will continue to get brighter and more conspicuous during the coming months. Among the northern constellations, Ursa Major, the great bear, shines in the northeast, the handle of the dipper now pointing downwards, and the pointers, at the upper side of the bowl, opposite the handle, pointing, as usual, to Ursa Minor, and the Polestar. In the northwest is the W-shaped constellation of Cassiopeia, and below this lady is the king, Cepheus.

During February, the moon is new on the sixth. On the ninth, it will be in conjunction with Venus. It will then be a narrow crescent, and, in the early evening, the planet will be seen about two moon diameters to the south, the two forming a brilliant spectacle. The moon reaches first quarter on the 14th. On the 21st it is full, and on the 28th it reaches last quarter. Thus the middle of the month, from about the 11th to the 23rd, will have moonlight evenings.

ARCHAEOLOGY

Milkweed Lines Moccasin Of Arkansas Cave Baby

A TINY BABY'S moccasin, softly lined with the down from milkweed seeds, is among the finds reported by Prof. S. C. Dellinger of the University of Arkansas, from a cave dwelling in the northwestern part of the state.

Some fond Indian mother made it for her papoose nobody knows how many centuries ago; for the other relics of human occupancy of the cave are of types that tie in closely with the ancient Basket Maker culture of the Southwest, and the Basket Makers are known to be very old—older than the Pueblos, whose history runs back into medieval datings.

The culture represented by the Basket Makers and the Arkansas cave people may have been very extensive, Prof. Dellinger suggested. Recent discoveries in caves in Kentucky hint that this early type of Indian culture spread well into the eastern part of America.

Whoever the occupants of these caves may have been, they were certainly farmers as well as hunters, for the shelter explored by Prof. Dellinger's party had so many corncobs on its floor that it bears the name "Cob Cave." The cave dwellers also raised pumpkins, gourds, two kinds of squashes, and used the seeds of a weed like goosefoot or lamb's-quarters for food. They were skilled weavers, using reeds, grasses and split cane for making baskets, mats, moccasins and many other objects.

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OCEANOGRAPHY

Springs of Water and Oil Rise from Bottom of Sea

A SPRING of fresh water gushing from the sea bottom just off St. Augustine, Florida, and flavoring the air with sulphur, submarine springs of oil off the California coast, a drowned canyon of the Hudson river outside New York harbor—these and other oddities of the ocean that are seen by the men that go down to the sea in the ships of the U. S. Coast and Geodetic Survey were described to the radio audience of the Columbia Broadcasting system, by Lieutenant-Commander R. R. Lukens in a talk arranged by Science Service.

The drowned canyon of the Hudson, Commander Lukens said, has been accurately surveyed by the government scientists. Soundings have found a depth of 2400 feet and a width of three miles. Although men will never see the grandeur of the scenery this might provide were it lifted above the ocean, this canyon still performs a useful function, for it serves as a sure guide in thick weather to ships provided with echo-sounding devices to aid in their navigation. They can "listen their way" along this deep trough, with as much confidence as they could watch beacon lights if they were visible.

Far on the other side of the world, off the southern Philippines, is a submarine valley compared with which the drowned Hudson gorge is a mere pin-scratch. This is Mindanao Deep, where the new cruiser Emden, Germany's first post-war fighting ship, in 1927 echo-sounded a deep spot for a record of 35,400 feet, or nearly six and three-quarters miles. This "hole in the bottom of the sea" lies within 75 miles of a mountain 6,027 feet high; so that there is a total difference in elevation of over 41,000 feet, which is 12,000 feet greater than the height of Mt. Everest.

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PHYSICS

Methods of Measuring Electron Rays Perfected

THE METHODS of measuring the powerful Lenard or electron rays have been perfected by an investigation of Dr. Lauriston S. Taylor of the U. S. Bureau of Standards.

Lenard rays are obtained by pushing electrons through a vacuum tube under a pressure of several hundred thousand volts. By use of a small window of metal or glass the speeding electrons can be obtained in the air outside of the tube. As they have been used, since their first production in large quantities by Dr. W. D. Coolidge, for a great variety of chemical and bilogical purposes it is important to have an accurate method of measuring them.

Three methods of measuring the rays were compared. Of these the use of a "Faraday chamber" was found to be most effective. This consists of two metal chambers enclosed one within the other and having openings through which the electrons may pass to the inner chamber.

The difficulty of making this measurement lies in the fact that the swift electrons striking a metal surface set free other electrons, so that the total amount of electricity cannot be obtained without some difficulty.

Science News Letter, January 30, 1932

IN SCIEN

INVENTION

Edison, Though Dead, Still Receives Patents

EDISON is dead, but the United States Government is still awarding him patents for his inventions. The Patent Office has recently issued a patent to Thomas A. Edison for an apparatus which electroplates nickel on diamonds to be used in cutting and grinding tools.

The diamond is the hardest known substance and it is therefore very efficient in grinding metals such as steel. It is difficult to mount these diamonds in suitable tools. Edison's invention overcomes this difficulty by providing a machine which electroplates nickel on the diamonds, after which they can be held rigidly in grinding tools. Edison also proposed to mount diamonds in a similar manner for phonograph needles.

The signature of Edison in his well-known, firm and bold handwriting appears on the drawing of the patent.

Edison received more than a thousand patents during his lifetime.

Science News Letter, January 30, 1932

ZOOLOGY

National Park Cook Has Foxes as Regular Boarders

WHEN the mess gong rings at Toklat construction camp in Mount McKinley National Park, six foxes appear regularly at the mess hall with the men of the construction gang, demanding a handout. Two of them are red foxes and four are of the cross species.

The cook at the camp reported to Park Superintendent Liek that, although she shows no partiality in feeding these self-invited guests, there are times when one will inadvertently get a larger portion of meat than the others, and right away a fight starts. When this happens she is compelled to leave the cook house and let the foxes turn it into an arena.

She further states that she is thinking seriously of submitting a bill against the National Park Service for services rendered in boarding six of its wild animals.

Science News Letter, January 30, 1932

E FIELDS

PHYSICS

Beam Radio May Result in Signals Sent to Mars

INHABITANTS of the earth are a step nearer successful communication with neighbors on Mars (if any!) and other nearby planets following the recent development of ultra-short wave beam radio.

This is the belief of Dr. I. E. Mouromtseff, research engineer of the Westinghouse Electric and Manufacturing Company, who has been directing the output from a short wave transmitter as if it were the beam of a searchlight, sending it from the top of one building here to the roof of another more than a mile away.

The energy that can be concentrated into a narrow radio beam is sufficient to pierce the Kennelly-Heaviside layer in the outer atmosphere which reflects back to the earth the longer waves in common use, Dr. Mouromtseff thinks.

"It is conceivable," he stated, "that the power we have succeeded in getting into our 42-centimeter beam is sufficient to pierce the Kennelly-Heaviside layer and travel the 35,000,000 miles to Mars. It is possible that such small power may carry such great distances because practically all the intervening space is a high vacuum and does not absorb the waves once they get through the earth's atmosphere."

Science News Letter, January 30, 1932

GENETICS

Corn Hybridized With Related Wild Grass

CORN, which is one of the orphans of the botanical world, having no immediate kin and only a few fairly near cousins, has been hybridized with a related wild grass by Dr. P. C. Mangelsdorf and Dr. R. G. Reeves of the Texas agricultural experiment station. Their researches are reported in the *Journal of Heredity.*

The cross on which the Texas experimenters spent most of their efforts was of corn as the female parent and a wild grass known as Tripsacum as the male or pollen parent. Tripsacum is common over the East, Midwest and South, and is known in some places as gama grass, in others as sesame grass. It is only distantly related to corn.

In order to get effective pollenation, it was necessary to remove the husks from the young ears and trim the silks down to a length of one inch. Then a good "set" of seed was obtained, at least with some specimens. The seed, however, did not mature well, most of it hardening finally as mere empty shells without living contents. Such seeds as were viable were very hard to coax into germination and good growth, bacteriological precautions having to be taken to keep most of them from spoiling before they sprouted. In spite of this, a number of the hybrid plants were finally grown to maturity. In general form and in most detailed characteristics they strongly resembled their male parent, the wild grass, and looked very little like corn.

Science News Letter, January 30, 1932

PLANT PATHOLOGY

Georgians Kill Own Trees To Fight Peach Disease

DURING 1931, about one million peach trees in Georgia were killed and pulled out by the roots, because they were suspected of being infected with phony peach disease.

Not all of these trees were actually diseased, but enthusiastic Georgia orchardists, cooperating with the Department of Agriculture, were anxious to be sure that all doubtful trees should be removed.

"You have a hopeless task," suggested a member of the House Appropriations Committee, to Dr. Karl F. Kellerman, assistant chief of the Bureau of Plant Industry of the Department of Agriculture, who explained the work.

"No," replied Dr. Kellerman, "we are beginning to believe we are approaching rather unusually quick success. The only difficulty we are facing is that in this period when the disease was not recognized, it has been scattered over a good many states in infected nursery stock, and there is no way by which nursery stock can be inspected to determine whether it is infected or not."

He explained that only eighteen months after the infection starts do the symptoms of phony peach disease appear.

Science News Letter, January 30, 1932

PHYSICS

Tests Show Magnet Does Not Sharpen Razor Blade

RAZORS cannot be sharpened merely by having their blades pressed against a magnet, experiments made by Prof. L. W. McKeehan of Yale University show.

Magnetic devices advertised to do away with the necessity of stropping blades have been carefully tested by Prof. McKeehan, an authority on magnetism. He found that they exert no noticeable sharpening action, he states in his report to *Physics,* a journal of the American Physical Society.

The sharpness of the blades before and after magnetic treatment was measured by the number of sheets of paper cut by the blade in four strokes. With this test a study was also made of the sharpening produced by stropping.

"Extravagant statements, like those made for the 'magnetic sharpener,'" said Prof. McKeehan, "can only diminish the confidence of the general public in better-founded claims presented for inventions in which physical principles are correctly applied."

The study also revealed the fact that the two edges of the same blade may vary greatly in degree of sharpness.

Science News Letter, January 30, 1932

METEOROLOGY

Less Danger of Fire If Red Lightning Strikes

WHITE LIGHTNING, which flashes down through dry air where no rain is falling, is much more likely to start a fire if it strikes a building or a tree than is red lightning, which flashes through rain that has already wet what it is about to strike.

In a report to the American Meteorological Society, Prof. W. J. Humphreys of the U. S. Weather Bureau explained why incendiary lightning signals its danger with a white glare, while lightning less likely to start fires glows red. Both types are fundamentally the same; both are electrical discharges through the atmosphere. But a discharge through dry air has only the air gases—oxygen and nitrogen—to render glowing hot; and these always shine with a white light.

Lightning that passes through the rain breaks some of the water apart into hydrogen and oxygen, and the characteristic color of incandescent hydrogen is red.

Science News Letter, January 30, 1932

ASTRONOMY

The Dark Companion of Sirius

"A Classic of Science"

Strange Stuff Composes This Dark Star Discovered by The Father of America's Long Line of Super-Telescopes

ON THE PROPER MOTION OF SIRIUS IN DECLINATION. By Truman Henry Safford. In Monthly Notices of the Royal Astronomical Society, Vol. XXII. London, 1862.

IT IS well known that *Sirius* exhibits irregularities of proper motion, both in Right Ascension and Declination. Bessel (*Ast. Nach.* Nos. 514-16), and Dr. C. A. F. Peters, in a Memoir, "Ueber die eigene Bewegung der *Sirius*, Königsberg, 1851", also republished in vol. xxxii. of the *Astronomische Nachrichten,* have investigated the variations of proper motion in Right Ascension. The hypothesis which these distinguished astronomers have adopted is, that the motions are performed around some center of gravity, which is not at *Sirius* itself. This involves the idea of a dark body of considerable mass, whose attraction is exerted to draw *Sirius* from its hypothetical motion in a straight line. Dr. Peters does not, as I understand, insist that the dark body is of greater mass than *Sirius* itself; so that it may (possibly) be of planetary character. . . .

ON THE COMPANION OF SIRIUS, by Prof. G. P. Bond, Director of the Observatory of Harvard College. In Astronomische Nachrichten, März 21, Nr. 1353, Altona, 1862.

An interesting discovery of a companion to Sirius was made on the evening of Jan. 31 by Mr. *Clark* with his new object-glass of eighteen and one-half inches aperture.

I have been able to observe it with our refractor of fifteen inches, as follows:

1862 Febr. 10

Angle of Position	85°15′±1°1
Distance	10″37 ±0″2

When the images are tranquil the companion is distinctly enough seen, but these moments are quite rare, as the low altitude of Sirius exposes it to almost continual atmospheric disturbances. I shall take the first favourable opportunity of repeating the measures which not improbably may stand in need of correction, especially in the distance.

The discovery is a very strong testimonial to the excellence of the new object-glass, but I was quite prepared for such a proof of its powers from having already witnessed its excellent performance on other stars. The focal length is twenty-three feet which is only a few inches longer than that of the great refractors of Cambridge and Poulkowa; the angle of aperture is consequently considerably larger which must be regarded as an advantage since it seems to have been gained without sacrifice of defining power.

Overpowering Brilliancy

ON THE COMPANION OF SIRIUS; by Prof. G. P. Bond. In The American Journal of Science and Arts (Silliman), second series, Vol. XXXIII, New Haven, 1862.

The companion of Sirius, discovered by Mr. Clark on the 31st of January, with his new achromatic object-glass of *eighteen and one-half* inches aperture, I have succeeded in observing with our refractor as follows:

Angle of position,	85°51′±1°.1
Distance	10″37 ±0″.2

The low altitude of Sirius in this latitude, even when on the meridian, makes it very difficult to catch sight of the companion, on account of atmospheric disturbances; when the images are tranquil, however, it is readily seen. It must be regarded as the best possible evidence of the superior quality of the great object-glass, that it has served to discover this minute star so close to the overpowering brilliancy of Sirius. A defect in the material or workmanship would be very sure to cause a dispersion of light which would be fatal to its visibility.

It remains to be seen whether this will prove to be the hitherto invisible body disturbing the motions of Sirius, the existence of which has long been surmised from the investigations of Bessel and Peters upon the irregularities of its proper motion in right ascension.

A discussion of the declinations of Sirius, establishing a complete confirmation of the results of Bessel and Peters, has been recently completed and published by Mr. Safford. The following passage is extracted from the last annual report of the president of Harvard College. Alluding to the operations at the Observatory, the report gives, as the conclusion of this discussion, "an interesting confirmation of Bessel's hypothesis that the star revolves around an invisible companion in its near vicinity;—the period of revolution is about fifty years."

It will require one, or at the most, two years to prove the physical connection of the two stars as a binary system. For the present we know only that the *direction* of the companion from the primary accords perfectly with theory. Its faintness would lead us to attribute to it a much smaller mass than would suffice to account for the motions of Sirius, unless we suppose it to be an opaque body or only feebly self-luminous.

ON THE SATELLITE OF SIRIUS. By Otto Struve. In Monthly Notices of the Royal Astronomical Society, Vol. XXVI. London, 1866.

Two years ago I had the honour to communicate to the Royal Astronomical Society the first results of my micrometrical measures of the satellite of *Sirius,* discovered by Mr. Alvan Clark. Though at that time the comparison of the observations made in 1864 with those of the preceding year strongly favored the supposition that the small star did not

ALVAN CLARK

Expert grinder of record-breaking telescope lenses, whose discovery of Sirius' companion solved one astronomical puzzle only to pose a greater one.

participate in the large proper motion of *Sirius,* and, consequently, was not physically connected with it, I indicated the reasons which induced me to discuss these appearances, and suspended therefore the judgment about that conviction at least until the next year, when the differences between the orbital motion and the relative motion in the supposition of a merely optical juxtaposition would have increased to nearly the double amount. At present, after having two years' observations more, we are enabled to submit the question to a stronger examination. . . .

From these formulae we deduced the observed change for three years; in distance = + 0″.63; in position angle = —6°.38.

If the small star formed only with the large one an optical double star, the mean proper motion of *Sirius* would have changed in three years the relative distance by + 2″.56, and the angle of position by —15°.02,—values that might be increased to + 2″.81 and —16°.17, if we introduce the ascertained inequalities of that proper motion. Evidently our observations do not agree with similar changes; therefore this hypothesis must henceforth be given up.

Moreover, the excellent investigations of Dr. Auwers (*Ast. Nach.* No. 1506), on the orbital motion of *Sirius,* demands for the disturbing body in the indicated interval an increase of the distance by 0″.55, and diminution of the position angle by 5°.31; values agreeing so nearly with those deduced from our micrometrical measures, that we scarcely can doubt that the satellite discovered by Mr. Alvan Clark is really the disturbing body. . . .

Admitting then that the observed satellite is identical with Bessel's obscure body, the above given relation d=3.087 *delta,* indicates that its mass must be estimated approximately half that of *Sirius* itself. If both bodies had the same physical constitution, this relation of the masses would assign to the globe of the satellite a diameter only 1.26 times smaller than that of the principal body, and therefore, considering the extraordinary brightness of the large star, we would be induced to place also the satellite in the first class of magnitude. With this conclusion the observed brightness of the companion forms a manifest contradiction. It is commonly said to be of the 9th or 10th magnitude; and only in the spring of 1864 I have noted it once as of the 8th magnitude, probably on account of an extraordinary favourable state of the atmosphere. Hence it follows that, to maintain the identity, we must admit that both bodies are of a very different physical constitution. . . .

White Dwarf Stars

THE INTERNAL CONSTITUTION OF THE STARS, by A. S. Eddington. Cambridge University Press, Cambridge, England, 1926.

If stellar matter at the density of platinum has still the compressibility of a perfect gas, the limiting density must be much higher. It is therefore possible that matter in the stars may attain densities unparalleled in terrestrial experience. Conversely, if we can discover in the universe matter of transcendently high density, it will be the strongest possible confirmation of our conclusion that in the ordinary dwarf stars matter is still a long way from the maximum density and therefore behaves as a perfect gas.

We realise at once where the search should begin, for it happens that the *white dwarf* stars have raised this very question. "Strange objects, which persist in showing a type of spectrum entirely out of keeping with their luminosity, may ultimately teach us more than a host which radiate according to rule". The most famous of these stars is the Companion of Sirius.

The mass of Sirius *comes* is found from the double star orbit and is quite trustworthy. The determinations range from 0.75 to 0.95 of the sun; we adopt 0.85. The absolute magnitude is 11^m.3 corresponding to a luminosity 1/360 of that of the sun. The faintness would occasion no surprise if this were a red star; but in 1914 W. S. Adams made the surprising discovery that the spectrum is that of a white star not very different from Sirius itself. The spectrum is *F* O, or if anything, a little earlier (towards *A*). Assuming that type *F* corresponds to an effective temperature 8000° —it can scarcely be less in so dense a star—and using the absolute magnitude 11^m.3 we find by (87.2) the radius 18,800 km. Apparently then we have a star of mass about equal to the sun and of radius much less than Uranus. The calculated density is 61,000 gm. per cu. cm.—just about a ton to the cubic inch.

This argument has been known for some years. I think it has generally been considered proper to add the conclusion "which is absurd".

Apart from the incredibility of the result, there was no particular reason to view the calculation with suspicion. The mass is well established and the radius is found by the method used in predicting the radii of *alpha* Orionis, Antares, etc.—predictions afterwards confirmed by direct measures with the interferometer. It has been suggested that the light is reflected from Sirius, the companion being of low density and having little light of its own. Apart from any intrinsic difficulties in this suggestion, nothing is gained by explaining the companion of Sirius in a way which will not apply to the other white dwarfs that have been discovered. The bright component of *o*2 Eridani is a white dwarf and it has no bright and hot star in its neighborhood.

It seems that Sirius *comes* either has the enormous density above stated, or else at some low effective temperature probably below 3000° it is able by unexplained means to produce an imitation of the leading features of the *F* spectrum sufficiently close to deceive the expert observer. I suppose that until recently the first alternative was considered incredible. It seemed that the radiation of the white dwarfs must be set down as one of those paradoxes which arise from time to time when imperfect theoretical knowledge is brought to bear on observation. But we have now reached the conclusion that the density is not incredible, and have some inclination to accept the straightforward calculation. Some difficulties remain—sufficiently impressive to deter us from accepting the high density as proved without further confirmation. . . .

The density of the companion of Sirius can be submitted to a crucial ob-

servational test, viz. the third Einstein effect or shift of spectral lines to the red. If the high density is right this effect will be very large since it is proportional to M/R which is 31 times as great for the star as for the sun. The predicted shift is equivalent to a Doppler displacement of 20 km. per sec., and there is no fear of confusing it with miscellaneous sources of spectral shift (the K term) which can scarcely exceed 3 or 4 km. per second. In an isolated star there would be no means of separating the Einstein shift from a genuine Doppler displacement due to line-of-sight velocity by observation of Sirius itself. The observation in fact consists in differential measures of the spectra of Sirius and its companion; the small difference of orbital motion between them is known and can be allowed for.

This test has been carried out by W. S Adams at the Mount Wilson Observatory. . . . We have then

General mean, Companion *minus* Sirius	+23
True Doppler Effect (orbital motion)	+ 4.3
Einstein Shift	+19 km. per sec. . . .

This observation is so important that I do not like to accept it too hastily until the spectroscope experts have had full time to criticise or challenge it; but so far as I know it seems entirely dependable. If so, Prof. Adams has killed two birds with one stone; he has carried out a new test of Einstein's general theory of relativity and he has confirmed our suspicion that matter 2000 times denser than platinum is not only possible, but is actually present in the universe.

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CHEMISTRY

Alabama Scientists Declare Seven Elements are Mixtures

GOLD, platinum and five other of the simple, ultimate chemical elements are each, according to the indication of evidence obtained, mixtures of atoms closely similar but not identical.

Dr. Fred Allison and Edgar J. Murphy of the Alabama Polytechnic Institute have discovered this by another successful application of their new and powerful method of chemical analysis which has detected for a first time the last two of the missing chemical elements numbers 87 and 85. The result was first announced in the *Physical Review* and the *Journal of the American Chemical Society.*

The weight of their atoms is the only respect in which the two forms of gold atoms are found to be different. Isotopes, the name given by the chemist to those chemical twins, have already been found in many of the well-known elements but never before in the seven elements just examined.

Dr. A. W. Aston of Cambridge, England, to whom more than anyone else present-day knowledge of isotopes is due, has shown, for instance, that aluminum has only one kind of atom, silver has two and magnesium three isotopes.

Dr. Aston's method and the other ways used till now to find isotopes is not suitable for the heaviest atoms. The delicate method of chemical analysis recently invented by Dr. Allison, however, has enabled scientists to distinguish between these isotopes for a first time. With its aid gold, platinum, ruthenium and thallium have been shown to have two isotopes, and palladium, tantalum and thorium to have three atomic constituents.

The new analysis depends on observing the time that elapses between the application of a magnetic force to a transparent liquid and the effect on a beam of light passing through the liquid. Each substance dissolved in the liquid shows up independently of others. Separate traces have been obtained by Dr. Allison and his colleagues for each of the isotopes of many elements whose isotopic constitution had already been determined. This suggested the possibility of looking for isotopes in the heavy atoms, till now unknown.

The new magneto-optic method of analyzing substances is rapid and cheap, does not destroy the substance examined and detects very small quantities even in the presence of large amounts of a second substance.

The apparatus is thirty times as sensitive in finding traces of substances as the spectroscope which has long been one of the most effective sleuths for the chemist. A good miscroscope can actually detect smaller amounts of a substance than the magneto-optic method of analysis but, unless under very special circumstances, this is not possible when there is an admixture of a second substance. A good chemical weighing balance is a million times less exact than the new method.

Experiments are also proceeding on using the method to determine the actual amounts of these traces of substances, not simply whether they are present.

Other interesting possible outcomes of the work are methods of finding the speed of an electric impulse along a wire and the speed of light in transparent liquids.

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AGRICULTURE

Department of Agriculture To Curtail Part of Work

SAVINGS of many thousands of dollars by curtailing experimental and agricultural protective work and limiting personnel is planned by the U. S. Department of Agriculture in 1932-33.

Hearings before the House Committee on Appropriations just released show that while more than three million dollars reduction in appropriations over 1931-32 is planned, members of the subcommittee scrutinized every item carefully and threshed out with Departmental chiefs the necessity for much of the work held by the Bureau heads to be essential to agriculture and industry.

Among the activities of the Department cut down this year are explorations for foreign plants; practical work in barberry eradication heretofore carried on because of the black stem rust disease which the barberry carries to wheat crops; rubber investigations; and certain forest products laboratory experiments.

An important point was brought out by scientists appearing before the committee, which served as a warning not to cut appropriations for investigational work too severely.

"During a time of depression," said Dr. Karl F. Kellerman of the Department, "we must remember that the cheap cure-alls, the patent medicines are likely to find their greatest opportunity for exploitation." For that reason, he indicated the scientific research laboratories must be open with work under way to refute false claims.

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GEOLOGY

Earthquakes and Volcanoes to Be Studied at Bottom of Sea

International Expedition to Caribbean Hopes to Explain How Continents were Once Connected by Land Bridges

EARTHQUAKES and volcanic disturbances in islands off the southeast coast of the United States promise to become less mysterious to scientists following an international expedition to this region which began to leave American ports this week.

Because the Caribbean is a region where ocean deeps and intervening submerged mountain chains have been active during recent geological ages in creating and submerging islands, geologists have sought the clues which might better explain how continents were once connected by land bridges. The additional knowledge of a part of these islands and their surrounding waters which will result from the expedition may help explain how South America and Africa or Africa and India were once joined by land.

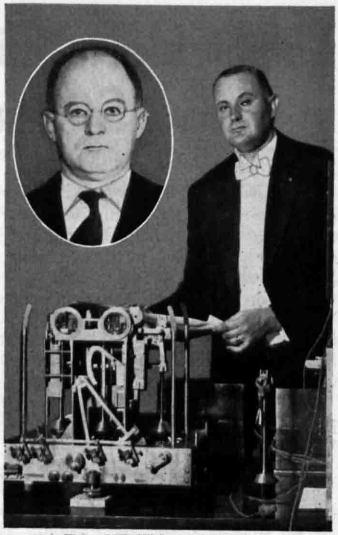
The studies that are expected to be of greatest value to seismologists and volcanologists will be made by new echo-sounding apparatus on the U. S. submarine S-48 and by the improved Meinesz gravity-measuring apparatus which will be operated by its inventor, Dr. F. A. Vening Meinesz, of Holland. Prof. Richard M. Field, of Princeton University, is director of the expedition.

"We wish to know not only what has gone on in the past in the region of the Bahama Islands," Prof. Field stated, "but also what is going on there now. If we can discover the causes for the uplift of these islands and their maintenance as well as the mile-deep depressions which exist between them, and in addition the general topography of the Bartlett Deep sinking to a depth of about four statute miles just to the south of Cuba, we would unquestionably learn something further regarding the origin and periodicity of the earthquakes in this region, and possibly the origin and periodicity of volcanic activity in the southwest islands of the archipelago."

Dr. Meinesz takes to a submarine to measure the force of gravity because he finds that his instruments are more steady below the surface than above. He has already traveled more than 50,000 miles in submarines while making many hundreds of gravity readings and he expects to increase his under-sea mileage by 4,000 during the coming two months.

For the past few weeks Dr. Meinesz has been calibrating his apparatus at the U. S. Naval Research Laboratory. He will leave Norfolk, Va., Wednesday, Jan. 27, for the scene of his work.

Gravity measurements to be taken from the submarine will be supplemented by land observations on fifteen or twenty islands of the Bahamas. Prof. Field explained that the region of the Bahamas, as well as the general region of the West Indies and the Caribbean sea, have been selected as a base of operations not only because of the desire of geodesists and geologists to discover as much as possible regarding the physical characteristics of this region and the possible origin of its topography, both surface and subsurface, but also because the region affords a special opportunity to test certain prevailing theories as to the origin of major inequalities of the earth's surface.



DR. VENING MEINESZ

—Dutch scientist and the apparatus with which he will measure the force of gravity at different points in the sea region off southeast United States. Inset shows Prof. Richard M. Field, of Princeton University, who leads the expedition.

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AERONAUTICS

Office Is Scene of 500 Flights Across Two Oceans

THOUGH an airship has flown over the Pacific Ocean only once and crossings of the Atlantic by airship number less than a score, more than five hundred imaginary flights have been made at the inland city of Akron, Ohio.

Both the take-offs and the landings of these voyages, for which no ship is used, are made in the offices of the Goodyear-Zeppelin Corporation, and their only purpose is the assembling of scientific data to make safe the real crossings when they do start. The imaginary ships are navigated in accordance with actual weather conditions of past dates. J. C. Hunsacker, vice-president of the Goodyear-Zeppelin, and Ward T. Van Orman, well-known balloonist and meteorologist for the company, direct the flights.

Official weather reports are closely studied, as are the logs of steamships, so that the air mariners know exactly what conditions would have been encountered from the time the airship left its hangar until it docked at its destination. Data obtained from the imaginary flights is worked over in an effort to so schedule and route the ships that voyages could have been made in less time.

The world's major wind system, well defined, is the guiding "star" for the trips. Although airships of the present day are ultra-modern and capable of a top speed of 80 miles per hour in a dead calm, airship designers have learned they must also be "wind-wise."

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MEDICINE

Tuberculosis Germs Detected In Blood Stream by New Test

A NEW METHOD by which the presence of tuberculosis germs can be detected in the circulating blood of patients suffering from tuberculosis has been disclosed. The method, developed by Prof. Ernest Loewenstein of Vienna, was described by Dr. Laszlo Detre, of the University of Budapest, Hungary, in a report to the District of Columbia Medical Society.

By this method, Dr. Detre said, the presence of the germ can be detected in very early stages of pulmonary tuberculosis, which is important from the standpoint of successful treatment; in cases of surgical tuberculosis in which there is no fever; and in different forms of tuberculosis of the skin.

"It has proved," said Dr. Detre, "that contrary to older opinions, in an organism attacked by tuberculosis there is a regular circulation of tubercle bacilli in the blood stream."

By means of the new method, it is claimed, certain other diseases have been found to have a tuberculous origin, for instance, acute polyarthritis or acute inflammation of the joints, popularly known as rheumatism. Until now, certain infections of teeth or tonsils have been considered responsible for this disease, Dr. Detre pointed out. But by means of the new test, a tuberculous origin of the disease was found. In most of these arthritic cases it was the bovine form of the tuberculosis germ, that is, the form found in cattle, which played the important role, Dr. Detre stated. Another disease which the new test is said to show has a tuberculous origin is multiple sclerosis, a nervous disease whose cause is generally considered unknown.

Dr. Detre emphasized the practical consequences of the new findings and advised American bacteriologists to follow this new line of research. New methods of treatment are suggested as a result of this new test, he said. Dr. Loewenstein, who has been working for 15 years on this test, which involved the development of a new synthetic culture medium for the germs to grow on, is receiving samples of blood from cities all over Europe for examination by the new method.

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PSYCHOLOGY

Babies Like Red Best While Adults Prefer Blue

IF YOU WISH to make a hit with a young niece or nephew, give the baby any kind of plaything, just so long as it is red.

Red is by far the favorite color of infants, Dr. Ruth Staples, of the University of Nebraska, will report in a forthcoming issue of the *Journal of Experimental Psychology*. Much farther down in the scale of choice are the three other colors which she measured —yellow, blue, and lastly green.

Older children, not yet of school age, still prefer red, though not so strongly. Yellow, however, has now dropped considerably in value. Grade school children show a preference for blue. For adults this preference for blue is very strong, and yellow descends even lower in the preference scale.

This evidence that color likes and dislikes are modified by age was collected by Dr. Staples in experiments conducted at the Institute of Child Welfare at the University of Minnesota.

Dr. Staples believes that infants are able to respond to colors at the early age of three months.

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ZOOLOGY

Nature Ramblings

By FRANK THONE

Migrating Caribou

HUNTERS are oiling up their guns and watching the skies for the first north-flying wedge of wild geese. Spring is in the offing, frosty though the promise is; migrating creatures are stirring, and will soon be on the move.

And birds are not the only migrants, though they do fly the farthest and attract the most attention. One of the most impressive of all animal migrations is that of the caribou, sometimes called the North American reindeer.

Ranging over the whole of Alaska with the exception of the western part of Seward peninsula and Bering Sea islands, the caribou is divided into several sub-species. In the far northern tundras, subject to icy blasts from the pole and to a hard struggle for existence, he is smaller, dark gray in color, with longer, less branching horns. In the Yukon Valley, where conditions are favorable, there occurs an intermediate form, while at the headwaters of the Matanuska river and near Mount McKinley the caribou are the giants of their kind. These weigh six to seven hundred pounds and are next to the moose in size in the deer family. The Arctic species has been badly decimated by Eskimos and Indians, but the other two forms are very numerous. There must be many thousands of the animals, although an accurate census is impossible owing to their roving habits.

Just why caribou should journey over a thousand miles to the north each spring is a mystery unless they desire to escape the fly plague of the lowlands. While they are on the plateaus the calves are born and reared. The autumn migrations are definite and the caribou seem anxious to get to the winter quarters. Then it is they will march right through the streets of towns, unafraid of the loud barking of the dogs.

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ENGINEERING

Slight Changes in Car Design Would Decrease Accidents

Correction by Charles R. Hoopes Letter 2/3/32

IF THE LEFT windshield cornerpost of his car measures more than five inches across, the average motorist stands a good chance of meeting disaster at the next highway intersection. This conclusion, based on a field survey by Victor W. Killick, statistician of the Division of Motor Vehicles and California Highway Patrol, reveals the automobile designer as one greatly responsible for the car owner's safety.

Following extensive investigation of accidents in California and 22 other states, Mr. Killick says that obstruction of the driver's vision through features in the design of the car body is the primary cause of collisions at intersections. Such accidents, he found, are by far the most commonly encountered today.

In a report to the Society of Automotive Engineers, Mr. Killick states that there is a definite relation between the size of the windshield cornerpost and intersection accidents. Many of the accidents investigated occurred when the cornerpost had a diagonal of five inches or more across the horizontal section. The area obscured from view was found to vary with the distance of the driver's eyes from the post, normally 24 inches.

The windshield cornerpost, however, was mentioned as but one of the devices which limit the vision of the auto driver. Narrow side and rear windows, low front seats such as those in sport models, and light switches on steering wheels were disclosed as making the auto more of a death trap.

The narrow windows, Mr. Killick states, cut off the driver's view of the rear so that in making a left-hand turn he is struck by a car which he has totally failed to see. Windows inconveniently high, he says, many times cause the driver to give unconsciously the right-hand turn signal when the left-hand turn signal is meant.

Low seats make it impossible to see the right hand side of the road; numerous cars which run off into the ditch on that side have seats not raised sufficiently. Almost every time a child is killed at an intersection, Mr. Killick reveals, it is because the low seat prevents the driver, his attention focused on the traffic signal, from seeing the child directly in front.

Light switches atop the steering column were pointed out by Mr. Killick as being a serious cause of accidents. The driver's coat sleeve was found to catch frequently in the sliding switch and bring complete darkness just as a turn was being made. Although regarded as a feature of modern design, the steering wheel light switch has definitely been responsible, Mr. Killick says, for several thousand deaths in California during the last year. accidents, and injuries

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• First Glances at New Books

Psychology

CHANGE OF INTERESTS WITH AGE—Edward K. Strong, Jr.—*Stanford University Press,* 235 p., $4. The report of a study, made in connection with the later maturity study at Stanford, in which 2,000 men between the ages of 20 and 60 told of their interests, their likes, and their dislikes. Some interests do change considerably with age. Young men of 25 like such things as driving an auto, musical comedies, and the work of an explorer; more mature men prefer nights spent at home, art galleries, and contributing to charities. In other matters, age makes little difference; the occupations of auctioneer and undertaker are disliked about equally by all ages. It is probable that all ages will also find interest in Professor Strong's book.

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Geology

BERMUDA DURING THE ICE AGE—Robert W. Sayles—*American Academy of Arts and Sciences,* 126 p., 13 pl., 11 tables, 1 map, $2. A careful geological attempt to reconstruct the Pleistocene Bermuda. The author is of the opinion that during the Ice Age this island group was larger in area, had a colder climate, and was buffeted by storms more frequently that at present.

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Astronomy

A TEXTBOOK OF PRACTICAL ASTRONOMY — J. J. Nassau — *McGraw-Hill,* 226 p., $3. Designed primarily for engineering students, this text concerns itself, after an introduction to the working methods of astronomy, to descriptions of instruments and instructions in their use to determine locations, and in time manipulations. There is useful appendix giving forms to be used, simple star maps, etc.

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History-Archaeology

TARA: A PAGAN SANCTUARY OF ANCIENT IRELAND—R. A. S. Macalister—*Scribner,* 208 p., $3. The old ballad line, "The harp that once through Tara's halls," has made Tara a familiar name, even to people who know little of Irish history. The palaces and fortifications on the Hill of Tara are fallen. But the place has so much of romance and historic importance about it, that Dr. Macalister, noted authority on Irish archaeology, has made Tara the subject of a book. It is his view that before Tara was a palace for Celtic kings it was a temple built by Bronze Age aborigines. It is to be hoped that excavations at the site, the most venerated in ancient Ireland, may eventually settle some of the questions which even Dr. Macalister's scholarly researches cannot decisively answer.

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Poetry

HOW PAN SHAPED THE LEAVES, AND OTHER POEMS—Paul Southworth Bliss—*Author,* 36 p., $1. Dedicated "To those who pause before trees", this slender sheaf of nature verses has in it the coolness of moonlit spring nights, the whiff of uncurling fern fronds and the glistening of new leaves. Although the author recommends some of his pieces especially for Boy Scouts and similar junior outdoorsmen, there is plenty in the book to make it worth a reading by their elders.

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Medicine

ALLERGY — Warren T. Vaughan — *Mosby,* 359 p., $4.50. If you suffer from hay fever, asthma, hives, eczema or any of the numerous other allergic diseases, you will want to read this comprehensive and practical book. You can probably find in it an answer to whatever question you have about allergy, which is as much a medical specialty as ophthalmology or ear, nose and throat work, the author says. This book is addressed both to patient and physician, and is written simply and directly so that the layman can benefit from it.

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Education

THE SEX EDUCATION OF CHILDREN—Mary Ware Dennett—*Vanguard,* 195 p., $1.75. An excellent book for parents or teachers emphasizing the importance of healthful attitudes rather than scientific terms in giving instruction on this subject.

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General Science

REPORT OF THE UNITED STATES NATIONAL MUSEUM, 1931—*Government Printing Office,* 223 p., 25c. Activities of the museum, the state of its collections, new accessions, and publications, are described in the annual report.

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Child Health

HEALTH PROTECTION FOR THE PRE-SCHOOL CHILD—George Truman Palmer, Mahew Derryberry and Philip Van Ingen—*Century,* 275 p., $2.50. A national survey of the use of preventive medical and dental service for children under six, as reported to the White House Conference on Child Health and Protection. The vast amount of material on the present status of child health in America which was collected for the conference is being made available to the general public and to those professionally interested in the subject through these publications. A great deal of the information in this book is presented by graphs and tables.

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Physics-Art

ULTRA-VIOLET RAYS AND WORKS OF ART—James J. Rorimer—*Metropolitan Museum of Art,* 61 p., 47 pl., $2.50 cloth, $2 paper. For three years Mr. Rorimer has been testing the use of ultra-violet rays to determine age and condition of art works. He has experimented not only with paintings and marbles, but also with ivories and textiles, and objects of metal, wood, ceramics, glass and enamel. This publication describes very specifically the methods and results. The illustrations, some in color, are a valuable feature of the publication.

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Ornithology

BIRDS OF ARKANSAS—W. J. Baerg—*Arkansas Agricultural Experiment Station,* 197 p., 76c. Prof. Baerg, who has been gathering materials for this popular field-book for the past ten years, has done an excellent job of combining easy understandability with essential accuracy. This list will be of use over a considerable range outside the state of Arkansas.

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Pharmacology

PHANTASTICA, NARCOTIC AND STIMULATING DRUGS, THEIR USE AND ABUSE — Louis Lewin, Transl. from 2nd German edition by P. H. A. Wirth—*Dutton,* 335 p., $3.75. This volume will appeal particularly to those interested in the problem of drug addiction. Dr. Lewin discusses many unusual drugs as well as the familiar narcotics, sedatives and stimulants.

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