

ATMOSPHERIC GASES SEPARATED IN UNIQUE EXHIBIT

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In the systematic mineral exhibit in Hall 34 there now may be seen in addition to the solid and liquid native elements, such as sulphur, mercury, copper, graphite, diamond, gold, and silver, an exhibit of the gases which occur as elements in the atmosphere. These eight gases are in separate glass tubes, and are made visible by passing an electric current through them, thus producing the characteristic spectrum of each. They are shown in the order of their quantity in the atmosphere, beginning with nitrogen, the most abundant. Oxygen, argon, hydrogen, neon, helium, krypton and xenon follow in this order.

Previous to 1894 the composition of the earth's atmosphere was thought to be four-fifths nitrogen and one-fifth oxygen, with a small percentage of carbonic acid gas and traces of water vapor, hydrogen and ammonia. In 1894, however, two famous English chemists, Lord Rayleigh and Sir William Ramsay, experimenting to make new determinations of the density of oxygen and nitrogen, discovered that atmospheric nitrogen was slightly denser than that prepared by chemical means. They concluded that the difference must be caused by a gas in the atmosphere, not previously isolated. Searching to discover what this might be, they succeeded in separating a hitherto unknown gas. They found it to be exceedingly inert and gave it the name argon.

Seeking other sources of this gas, they recalled that an American chemist, Dr. W. F. Hillebrand of the United States Geological Survey, had reported a few years before that the mineral pitchblende or uraninite contained a noticeable quantity of nitrogen. Investigating this so-called nitrogen, they found it to correspond with a gas discovered in the sun in 1868 by spectroscopic examination and given the name helium. This gas the English chemists found also to be a component of the atmosphere. Continuing the study, Sir William, with M. W. Travers, separated from the air three additional new gases. These are called neon, krypton, and xenon.

Of these gases, argon constitutes about 1 per cent by volume of the atmosphere. Xenon is the rarest and the heaviest, forming only one part in seventeen million of the atmosphere. Krypton constitutes about one part in two million, helium one part in two hundred and fifty thousand and neon about one part in eighty thousand. All these gases resemble argon in inertness and form a separate group. They have different atomic weights but similar chemical properties.

Several of these gases have proved to be of much commercial importance. Argon, on account of its inertness, is now used to fill electric light bulbs, replacing nitrogen, which was formerly used. Neon, owing to the brilliancy of its spectrum, is widely used for illuminated signs. It was the first element to give definite proof of the existence of isotopes, knowledge of which changed the scientific conception of the chemical elements.

Studies of helium have also produced results of much scientific and commercial importance. Besides occurring in the atmosphere, it was found that helium exists in a number of rocks and minerals, forms part of the gases evolved from mineral springs, and occurs in natural gas, in volcanic gases,

and in sea and river waters. Due to its lightness and non-inflammability, it has proved ideal for filling airships and balloons. As it is little soluble in body fluids, it is mixed with oxygen to supply atmosphere to workers in caissons and diving bells. As it becomes liquid at -258°C . it has also proved invaluable in producing extreme cold.

In 1903 it was demonstrated by Sir William Ramsay that helium was the end product of the disintegration of radium. This was the first known evidence of the transmutation of elements, and the knowledge that such a change could take place has had a profound influence on chemical and physical science. Few scientific investigations have been more fruitful or epoch-making in their results than those which began with a study of the density of atmospheric nitrogen.

BIRD GROUPS IMPROVED

The hall of bird habitat groups (Hall 20) has been completely rearranged and reopened to the public. The exhibits have been relabeled and transposed to improve the



California Condor Group

One of the series of eighteen habitat groups of birds on exhibition in Hall 20, which has been rearranged and improved.

lighting and display. There are eighteen groups of birds in this hall, all shown with scenic reproductions of their natural environments. Among the birds thus shown are the northern loon, golden eagle, California condor, whooping crane, wild turkey, white pelican, ruffed grouse, flamingo, jabiru stork, horned screamer, scarlet ibis, Alaska water birds, albatross, and mid-Pacific birds from the island of Laysan.

How pineapples grow is illustrated in one of the botanical exhibits.

NEW MEMBERS

The following persons were elected to membership in Field Museum during the period from November 16 to December 15:

Associate Members

Charles F. Baumrucker, Mrs. Theodor Breyer, Newton Burgstreser, Leo J. Carlin, Giuseppe Castruccio, Albert G. Duncan, Mrs. Charles K. Foster, John A. Heller, Bernard J. Kunka, Oscar F. Mayer, Dr. David B. Peck, Arthur J. Peterson.

Annual Members

William A. Brown, Nelson Earl Buck, William Burry, Jr., Robert Greene Dwen, Dr. J. Vernon Edlin, Armin Elmendorf, Mrs. C. Groot, Ralph J. Hines, Mrs. William K. Kenly, Mrs. Edward A. Kennedy, Mrs. George G. Kohn, Dr. Davies Lazear, Mrs. Bertha S. Ludlam, Dr. Theodore Stanley Proxmire, John William Scallan, Dr. C. O. Schneider, L. F. Summers, Sidney R. Sweet, Mason Warner.

JANUARY GUIDE-LECTURE TOURS

Following is the schedule of conducted tours of the exhibits during January:

Week beginning January 4—Monday: 11 A.M., American Archaeology, 3 P.M., Birds at Home; Tuesday: 11 A.M., Industries of Illinois, 3 P.M., Animal Life in Cold Lands; Wednesday: 11 A.M., Prehistoric Plants and Animals, 3 P.M., Oriental Theatricals; Thursday: 11 A.M. and 3 P.M., General Tours; Friday: 11 A.M., Woodland Indians, 3 P.M., The Cat Family.

Week beginning January 11—Monday: 11 A.M., Chinese Exhibits, 3 P.M., Desert Animals; Tuesday: 11 A.M., Primitive Costumes, 3 P.M., Hall of Plant Life; Wednesday: 11 A.M., Mines and Minerals, 3 P.M., Egypt; Thursday: 11 A.M. and 3 P.M., General Tours; Friday: 11 A.M., South American Animals, 3 P.M., Crystals and Gems.

Week beginning January 18—Monday: 11 A.M., Coal, Oil and Peat, 3 P.M., Africa and Madagascar; Tuesday: 11 A.M., Gourds and Their Uses, 3 P.M., Reptiles and Fishes; Wednesday: 11 A.M., Deer and Antelope, 3 P.M., Peoples of the South Seas; Thursday: 11 A.M. and 3 P.M., General Tours; Friday: 11 A.M., Horses and Their Relatives, 3 P.M., Musical Instruments.

Week beginning January 25—Monday: 11 A.M., Food Plants, 3 P.M., Interesting Geological Exhibits; Tuesday: 11 A.M., Moon and Meteorites, 3 P.M., Chinese Art; Wednesday: 11 A.M., Habitat Groups, 3 P.M., Maya, Toltec, Aztec and Zapotec Exhibits; Thursday: 11 A.M. and 3 P.M., General Tours; Friday: 11 A.M., Systematic Animals, 3 P.M., Man Through the Ages.

Persons wishing to participate should apply at North Entrance. Tours are free and no gratuities are to be proffered. A new schedule will appear each month in FIELD MUSEUM NEWS. Guide-lecturers' services for special tours by parties of ten or more are available free of charge by arrangement with the Director a week in advance.

Gifts to the Museum

Following is a list of some of the principal gifts received during the last month:

From Dr. James W. Walker—knife with sheath, Mandingo, West Africa; from Professor Ovid R. Sellers—lower mandible of member of Equidae from a reservoir of the Hellenistic period (fifth to third century B.C.), Palestine; from H. W. von Rozynski—135 herbarium specimens, Mexico; from George L. Fisher—112 herbarium specimens, Texas and New Mexico; from James Zetek—400 herbarium specimens, Barro Colorado Island; from Don Jorge Garcia Salas—41 herbarium specimens, Guatemala; from Companhia Ford Industrial do Brasil—200 herbarium specimens, Brazil; from Italian Chamber of Commerce—8 straw hats for the economic botany collection; from Professor Fortunato L. Herrera—225 herbarium specimens, Peru; from William J. Chalmers—section of varicolored tourmaline, Madagascar; from Martin L. Ehrmann—large carved fluorite vase, England; from American Museum of Natural History—5 photographs of vertebrate fossils; from Miss Nan B. Mason, Bryan Patterson, Frank H. Lett, and Paul C. Lett—14 fossil insects and fossil plants, Illinois; from Bernard Benesh—103 beetles, Illinois, Arizona, California, Brazil, and Germany; from Bryan Patterson—154 beetles, bugs, moths, etc., Nebraska; from C. von Hoffman—ant thrush, Formosa; from Dr. Mary J. Guthrie—3 bats, Missouri; from John G. Shedd Aquarium—4 specimens of electric eel, South America; from Dr. Karl Jordan—50 skins with 49 skulls of small mammals, Europe, England and Africa; from H. G. Moore—body and skeleton of flightless rail, Tristan da Cunha Island.

MEMBERSHIP IN FIELD MUSEUM

Field Museum has several classes of Members. Benefactors give or devise \$100,000 or more. Contributors give or devise \$1,000 to \$100,000. Life Members give \$500. Non-Resident (Life) and Associate Members pay \$100. Non-Resident Associate Members pay \$50. All the above classes are exempt from dues. Sustaining Members contribute \$25 annually. After six years they become Associate Members. Annual Members contribute \$10 annually. Other memberships are Corporate, Honorary, Patron, and Corresponding, additions under these classifications being made by special action of the Board of Trustees.

Each Member, in all classes, is entitled to free admission to the Museum for himself, his family and house guests, and to two reserved seats for Museum lectures provided for Members. Subscription to FIELD MUSEUM NEWS is included with all memberships. The courtesies of every museum of note in the United States and Canada are extended to all Members of Field Museum. A Member may give his personal card to non-residents of Chicago, upon presentation of which they will be admitted to the Museum without charge. Further information about memberships will be sent on request.



1932. "Bird Groups Improved." *Field Museum news* 3(1), 4-4.

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