

Field Museum News

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EXHIBIT REVEALS INFLATION ATTEMPT BY ANCIENTS

The evolution of money in China, from implements used for barter down to coins, is illustrated in a new exhibit in George T. and Frances Gaylord Smith Hall (Hall 24). How attempts were made to inflate the currency thousands of years ago, and how the people resisted, is told by Dr. Berthold Laufer, Curator of Anthropology. In the exhibit is a coin with an inscription which indicates an inflated value, many times the actual value in smaller coins. When such inflated currency was circulated, the Chinese people refused to accept it at face value, and used it merely at the actual value represented by the metal in the coin, Dr. Laufer says. As a result all inflation attempts failed, and several emperors were forced into bankruptcy.

Included in the same exhibit are collections of ancient Chinese public and private seals, and the world's earliest chessmen, made of bronze and dating back to the ninth century. There are also shown charms derived from coin designs, and rare old coins worn as charms to protect the wearer against demons, lightning, snake bites, and other dangers, and to bring luck, wealth, long life, and numerous descendants.

The currency exhibit begins with small bronze or copper bells, axes, spades, and knives which served as media of exchange in earliest times. These gradually assumed conventionalized forms, and finally became flat, thin and convenient for circulation. From these developed coins. The earliest circular coins, with round or square holes in their centers, are shown.

The earliest of the seals are of clay, the later ones of metal. Some, in addition to the owner's name, are provided with his thumb impression and thumbnail mark, and Dr. Laufer states that the Chinese were the first people to recognize the value of fingerprints in identification.

An exhibit of mediaeval cast iron objects from China, ranging in date from A.D. 618 to 1643, has also been installed in the same hall. A wide variety of objects is shown, including temple bells, Buddhistic and Taoistic figures, utensils, ornamental objects, and iron coins.

"During the Sung dynasty (A.D. 960-1279) scarcity of copper forced the government to resort to iron currency which was circulated

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NEW TAXIDERMY METHOD APPLIED TO ORANG

By WILFRED H. OSGOOD
Curator, Department of Zoology

Because it is one of the anthropoids or man-like apes, an orang is always interesting, but an especially prepared specimen placed on exhibition last month is extremely unusual. This orang is partly real and partly synthetic, and represents the first serious attempt to apply the so-called "celluloid" process to hairy mammals.

This process, developed by Leon L. Walters of the Museum's taxidermy staff,

has reached a high degree of perfection for the reproduction of naked and scaly animals such as amphibians and reptiles. It has also proved successful for the hippopotamus and the rhinoceros, and its potential advantages for preparing exhibits of animals which are mainly hairy but with the skin exposed on certain parts have been evident for some time past.

The recent receipt of an orang in fresh condition, shortly after its death, offered an opportunity for applying the process which was eagerly seized by Mr. Walters, and the result is a specimen exceedingly life-like in appearance and quite unique



New Orang Exhibit

This ape, now to be seen in Hall 15, represents the first application of the Walters cellulose-acetate process of reproduction to a hairy mammal.

among museum preparations. The dead animal was posed in a carefully chosen attitude based on studies of living orangs and molds were then taken from it, reproducing its form with utmost precision. By means of a special technique, the hair of the original animal was transferred to the reproduction, becoming embedded in the celluloid-like composition exactly as it was formerly in the skin. In effect, the skin was replaced by the composition and in the resulting specimen the only part not artificial is the hair.

The advantages of a reproduction of this kind are mainly in the increased fidelity to nature which is possible, especially in the fine detail of the surface of the skin and in its coloration, translucence and texture. Like other works of taxidermy, it is a combination of art and realism, but while its art does not necessarily suffer, its realism is less limited than by methods in which the dried and tanned skin is used. It does not threaten to displace earlier methods, however, except for subjects to which it is peculiarly adapted.

The orang reproduction is exhibited in Hall 15 in a case with the gorilla, chimpanzee, and gibbons in the systematic series of mammals.

LIFE BEYOND EARTH INDICATED BY METEORITIC BACTERIA?

By OLIVER C. FARRINGTON
Curator, Department of Geology

Is there life beyond the earth? The problem of whether life exists in other parts of the universe is one which probably will always be of interest to the human race. Aside from possibilities of "exchanging signals with Mars," probably the only physical source of evidence to which we can look for an answer is in those celestial rocks called meteorites. These missiles from outer space arriving on the earth have been examined for many years to see what light, if any, they would throw on the question. Until recently the only indication they have given that life might exist in the regions whence they came is the fact that hydro-carbons, similar to those which on this earth are of organic origin, have been detected in some meteorites. These compounds suggest that there may be plant or animal life outside of the earth, but no positive evidence in the form of observations of microscopic cell structure or other distinguishing features has ever been obtained from a study of them.

Recently a new suggestion that life exists elsewhere than on the earth arises from the work on meteorites of Dean Charles B. Lipman of the University of California. Dean Lipman's investigations, the results of which have just been published, seem to indicate that bacteria are sometimes to be found in the interior of stone meteorites, also known as *aërolites*. From these they may be extracted and their growth and multiplication carried on under terrestrial conditions.

Discovery of these bacteria also opens further speculation on the theory some scientists have propounded to the effect that the original forms of terrestrial life may have been brought to the earth by meteorites hundreds of millions of years ago.

Professor Lipman's experiments began several years ago when he found evidence of the existence of bacteria in ancient terrestrial rocks and in coal. Turning his attention to the possibility of finding them also in meteorites, he applied to several museums having large collections (among them Field Museum) for a supply of suitable material for an investigation. Especially desired were small individual meteorites, the interior of which had been completely sealed by the crust which formed on the surface during the journey through the earth's atmosphere. This crust presumably would insure retaining the contents of the interior in their original form and condition. Field Museum responded to this request by furnishing individuals of the Pultusk, Poland, meteorites which fell in 1868, of the Mocs, Hungary, meteorites which fell in 1882, and of the Richardton, North Dakota, meteorites which fell in 1918. Other museums cooperating were the American Museum of Natural History, of New York, United States National Museum, Washington, D.C., and the

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Field Museum of Natural History

Founded by Marshall Field, 1893

Roosevelt Road and Lake Michigan, Chicago

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Field Museum is open every day of the year during the hours indicated below:

November, December, January	9 A.M. to 4:30 P.M.
February, March, April, October	9 A.M. to 5:00 P.M.
May, June, July, August, September	9 A.M. to 6:00 P.M.

Admission is free to Members on all days. Other adults are admitted free on Thursdays, Saturdays and Sundays; non-members pay 25 cents on other days. Children are admitted free on all days. Students and faculty members of educational institutions are admitted free any day upon presentation of credentials.

The Museum's natural history Library is open for reference daily except Saturday afternoon and Sunday.

Traveling exhibits are circulated in the schools of Chicago by the N. W. Harris Public School Extension Department of the Museum.

Lectures for schools, and special entertainments and tours for children at the Museum, are provided by the James Nelson and Anna Louise Raymond Foundation for Public School and Children's Lectures.

Announcements of free illustrated lectures for the public, and special lectures for Members of the Museum, will appear in FIELD MUSEUM NEWS.

A cafeteria in the Museum serves visitors. Rooms are provided for those bringing their lunches.

Chicago Motor Coach Company No. 26 buses go direct to the Museum.

Members are requested to inform the Museum promptly of changes of address.

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.

BEQUESTS AND ENDOWMENTS

Bequests to Field Museum of Natural History may be made in securities, money, books or collections. They may, if desired, take the form of a memorial to a person or cause, named by the giver.

Cash contributions made within the taxable year not exceeding 15 per cent of the taxpayer's net income are allowable as deductions in computing net income under Article 251 of Regulation 69 relating to the income tax under the Revenue Act of 1926.

Endowments may be made to the Museum with the provision that an annuity be paid to the patron for life. These annuities are tax-free and are guaranteed against fluctuation in amount.

LIFE BEYOND EARTH?

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Colorado Museum of Natural History, Denver.

Professor Lipman's method of investigation consisted of first thoroughly sterilizing the exterior of each meteorite by scrubbing it with soap and water, then soaking it in a 30 per cent hydrogen peroxide solution, then in alcohol, and then heating it in a flame for thirty seconds. The meteorites were then placed in a variety of sterile culture media and allowed to remain from two weeks to five months. Under these conditions if any organisms had remained alive on the surface, growths would appear. In most cases no such growth occurred. Specimens which thus showed sterile surfaces were then transferred under sterile conditions to a sterile mortar in which they were ground to powder. Portions of the powder were distributed into various culture media and watched for whatever growths might develop.

Both the Mocs and Pultusk meteorites supplied by Field Museum yielded notable colonies of bacteria. These were mostly of the order of rod or bacillus forms, and cocci, but from one culture from the Pultusk meteorite there was produced a very remarkable organism. This organism proved to be autotrophic, that is, one which builds carbohydrates and protein from carbon dioxide and inorganic salts. As these are common constituents of meteorites, such organisms might be able to perpetuate themselves for a long period.

Many of the other forms found in the meteorites were spore-forming organisms. The preservation of spores in a dormant condition during a long period might have been possible. How long such spores might retain vitality is not known, but one case of germination after forty years is known, and in the view of Dean Lipman there is no reason to doubt a possible retention of their vitality for a period of many times that length. Many other bacteria obtained from the meteorites were coccus forms which are not believed to be spore formers, but in Professor Lipman's opinion they may have produced bodies which served the purpose of spores.

Studies which have been made on the age of the materials composing meteorites indicate that they are of the same general order in this respect as the solar system. The age of one stone meteorite has been calculated from its helium content to be 110,000,000 years. Under what conditions, or at what period, if any, during that time the growth of bacteria might take place in a meteorite, there is at present no means of determining. Naturally far more investigation is necessary before satisfactory conclusions can be drawn.

In order to determine what sources of food for bacteria might be found in meteorites, beyond those already mentioned, Professor Lipman also made some investigations to learn whether organic nitrogen was present. The result showed a small percentage of organic nitrogen actually present in all of seven stony meteorites which were examined. The existence of organic nitrogen in meteorites had not been previously known.

A specimen of the giant salamander of Japan, which grows to about fifty pounds in weight and five feet in length, is exhibited in Albert W. Harris Hall.

Ancient Inflation Attempt

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in large quantities, without, however, superseding the existing copper money," says Dr. Laufer. "The legal ratio made ten iron pieces the equivalent of one copper coin. This double standard naturally caused difficulties and the relative value of the two metals was subject to many fluctuations."

The casting of iron, Dr. Laufer states, is an art practised through all periods of Chinese history. In early times the Chinese dedicated cast iron to the service of the dead, as a precious and durable substance worthy of being offered to ancestors.

GLOBES SHOW ABUNDANCE OF CERTAIN ELEMENTS

Graphic illustration of the quantities existing in the crust of the earth of certain elements is afforded by small globes which are being added to some of the exhibits in the Department of Geology. So far, such globes, with maps of the continents outlined on them, have been installed with the aluminum, iron and silicon exhibits.

Aluminum is the most abundant of all metals. This is shown graphically on a sphere three inches in diameter by a circle, painted in aluminum color, 1.6 inches in diameter, which represents the space that would be occupied by all the aluminum in the crust of the earth if it were gathered into one place. On another globe of the same size the iron of the earth's crust is similarly represented, by a circle 1.27 inches in diameter. These proportions include not only the ores of sufficiently high grade for mining, but all other aluminum and iron deposits, it is explained by Henry W. Nichols, Associate Curator of Geology. On the other hand, it is emphasized that only the crust of the earth to a depth of ten miles, which is the farthest point accessible, is considered. There is reason to believe that the inaccessible interior of the earth contains vastly larger quantities, probably as much as two-thirds of the entire substance of the earth being iron.

On the globe devoted to silicon, the space occupied by the circle is 2.6 inches in diameter. This non-metallic substance is second only to oxygen in abundance as an ingredient of the earth's crust.

Museum Aids Rotenone Research

Recently in the *Journal of the Washington Academy of Sciences*, Howard A. Jones, of the Bureau of Chemistry, United States Department of Agriculture, published the results of experiments in the extraction of rotenone from derris and cube bark, mentioning particularly Peruvian cube from Field Museum.

Rotenone is a chemical compound prominent as an ingredient of insecticides. Mr. Jones finds cube much richer in rotenone than Old World derris bark. The cultivation of cube (*Lonchocarpus nicou*; a vine of the bean family), promises to become an industry of importance. The Field Museum material was obtained by Llewellyn Williams, Assistant in Wood Technology, while a member of the Marshall Field Botanical Expedition to Peru (1929).

An interesting habitat group of beavers may be seen in Hall 16.

An ingenious cradle for a baby, and a fox-skin swaddling, used by the Karok Indians of California, are displayed in Hall 6.



Farrington, Oliver C. 1933. "Life Beyond Earth Indicated by Meteoritic Bacteria?" *Field Museum news* 4(3), 1-2.

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