medium for the elicitation of filterable forms of bacteria. This is again evidence, it would seem, of the existence of filterable, viable forms of bacteria in purely protein solutions. And not only must mediums for the cultivation of the filterable states of bacteria be sterile; material from the human or animal body, and even cultures of bacteria themselves, in light of what has been stated, must be thought of as having possibly two or more distinct organisms living side by side. It has long been known, for example, that the virus of foot and mouth disease can be carried along with vaccine virus for considerable periods, and there is therefore the possibility that blood cultures may harbor more than one organism. In the foot and mouth disease-vaccine association, and in the filterable virus group generally, the protein which is usually associated, either from the body or in the artificially enriched medium, might suffice to keep the viruses in the filterable state, in which instance their presence would be readily overlooked. The details of recognition and separation of such complexes will naturally vary with individual cases.

Bacteria also may be similarly associated: there is some evidence already indicating that a filterable state of one microbe may be actually carried along, unrecognized, with a stock culture of another microbe, especially if transfers are made upon plain, nutritive meat infusion agar. One form may remain hidden, and entirely unsuspected until cultivation is practiced for a period of time in K medium. Reestablishment of the non-filterable form may reveal two organisms, where only one was presumed to be present.

Finally, a word about mediums. It is very obvious that the K medium, even with its variants as suggested above, is by no means the best that may be concocted. The same tissue from different animals affords, in specific instances, some differential advantages for specific cultivation of one or another microbe; therefore different mediums should be available. Reasoning from analogy, with some experimental evidence also, it would seem to be consistent to utilize homologous tissue from homologous species for difficult isolations. Also, within limits which vary with the type of microbe, there is advantage in training them to develop in alien host tissue protein for purposes of immunization and experimental infection.

SUMMARY AND CONCLUSIONS

1. The isolation of a filter-passing diplococcus from the blood of certain cases of influenza by means of a special cultural medium is described. The experimental effects of this organism, while in the filterable state, upon rabbits, is discussed.

2. A procedure is formulated for inducing at will both a filterable and a non-filterable state in bacteria. Mention is made of a series of experiments in which both the filterable and the non-filterable state has thus been induced in a series of well-known bacteria comprising a variety of types.

3. It is postulated that a majority, if not all, known bacteria can and do exist in a filterable and in a non-filterable state.

4. A preliminary report of the isolation of microbes in the blood, not only of cases of influenza, but also from common cold, rheumatic fever, arthritis, from Staphylococcus bacteriophage and Besredka's Staphylococcus Antivirus is presented in evidence of the ubiquity of the procedure.

5. An explanation of the chemical basis for the existence of bacteria, both in the filterable and non-filterable states, in the animal and human body, and in culture, is proffered.

6. The relation of this chemical concept to microbic infection, and the state of microbes in the body during infection is discussed.

In conclusion, it is a privilege as well as a pleasure to inscribe here my appreciation for the courteous cooperation of Dean Irving S. Cutter, Doctors Charles A. Elliott, Paul Starr, James G. Carr, Walter Nadler, Howard Alt and Herbert Barker, of the department of medicine, and to Northwestern University for the generous facilities and unrestricted opportunity for research which have contributed immeasurably to this investigation.

ARREST OF GEOLOGIC, ARCHEOLOGIC AND PALEONTOLOGIC WORK IN CENTRAL ASIA

By President HENRY FAIRFIELD OSBORN
AMERICAN MUSEUM OF NATURAL HISTORY

A PEIPING society originally known as the Cultural Society, but now more definitely organized as the Commission for the Preservation of Antiquities, on June 3, 1931, addressed the following letter to Dr. Roy Chapman Andrews in reply to an application of May 5, 1931, for the continuation of the American Museum explorations and researches in Mongolia:

Sir:

We beg leave to acknowledge the receipt day before yesterday of your note stating that members of your

Museum desire to proceed to Mongolia next year to resume their work of geological research.

In discussions held at meetings of the Committee, all present have considered that, since your expedition repeatedly declared, at the time when you demanded permission to proceed to Mongolia to carry on your work last year that the expedition was going to wind up its past work and would therefore discontinue its trips, and since the Chinese Government has now organized a Western Frontier Scientific Expedition to proceed to Mongolia, Kansu and Sinkiang to carry on various scientific researches itself, during the present period of time there of course exists no necessity for permitting members of your Museum to make further trips to carry on this work.

Should American scholars be willing to come to Peking to make scientific research into the geological materials concerning Mongolia to be obtained in future as a result of surveys by members of the Chinese expedition, the Chinese Government will certainly afford them all facilities in order to conform with the principles of non-discrimination between nationalities in respect of science.

The restrictions imposed by this society have not been placed on American exploration alone, for somewhat similar actions have been taken against the Swedish Expedition in Chinese Turkestan under Sven Hedin and more recently against the French Trans-Asiatic Expedition under Dr. Georges Haardt and P. Teilhard de Chardin, distinguished paleontologist and geologist, and the British Expedition under Sir Aurel Stein. This is in line with the now openly professed policy of the Peiping Commission to stop all foreign scientific work in China, no matter by what nationality. They have driven the distinguished archeologist, Sir Aurel Stein, out of Chinese Turkestan; they made very severe conditions for Dr. Sven Hedin on his last geographic expedition to Chinese Turkestan. They are putting every obstacle in the way of the present Trans-Asiatic Citroen Expedition of the French; they now bring to a full stop the ten years' work of the Central Asiatic Expedition of the American Museum.

In the meantime by articles in the Chinese newspapers this commission is giving out erroneous statements as to the work of these various foreign explorations, rousing a hostile attitude among the people and thereby cultivating among the Chinese the thought that all foreigners are enemies of their country, and it is surprising to find that the membership of this commission is not confined to Chinese who are ignorant of the friendly and sincere intentions of the United States towards the Chinese people and their institutions, but that it includes returned American students who should understand the American attitude toward China and be grateful for it.

For three years past, namely, since August, 1928, when the Peiping Commission seized the Mongolian collections of the Central Asiatic Expedition at Kalgan the American Museum has been working through the Chinese Minister, Dr. C. C. Wu, through Secretary of State Stimson, through Assistant Secretary Nelson T. Johnson, now Ambassador to China, and through the Chinese Government of Nanking to overcome the hostility of the Peiping Commission and set before the Chinese the true state of affairs, namely, that throughout its entire ten years of exploration in China and Mongolia, the American Museum of Natural History has been actuated only by the highest and most generous motives. Every stage of its procedure has been with the full knowledge of the Chinese Government at Nanking and Peiping and with the Mongol Government at Urga—not only with full knowledge but with full prior consent. Moreover, it was agreed from the outset that the American Museum would leave entirely untouched the tempting fossil fields within the boundaries of China proper to the well-organized National Geological Survey of China, and that it would cooperate with the National Geological Survey of China in sending duplicates or replicas of fossils not only of Asiatic origin, but of American fossils cognate to those to be discovered in Central Asia. More than this, during President Osborn's visit to Peiping in the year 1923, he offered to establish a branch of the American Museum within one of the now vacant palaces of the Forbidden City, to send duplicates of all the zoological collections made in China and all the zoological and paleontological collections made in Mongolia. The then director of the Peiping Museum of Art, Dr. Kungpa King, took the deepest interest in this project and actually aided in the selection of one of the palace buildings suitable for the exhibition of natural history collections. Long prior to this the American Museum issued a manifesto which was widely printed and circulated throughout northern China declaring its sympathy in the preservation of all archeological and prehistoric objects and its opposition to looting and destroying these precious records of the ancient history of China.

The abrupt interruption of these friendly and most promising relations came with the seizure of the entire collections of the year 1928 by the organization then known as the Cultural Society. Long months of negotiation between the American Museum, Washington, Nanking and Peiping ensued, culminating in the final release of this collection of fossils obtained entirely within the borders of Mongolia and beyond the confines of China, and composed almost entirely of geological and paleontological objects. In the year 1929 permission to reenter Mongolia was again refused by the Peiping Commission; in the year 1930 the permission was reluctantly granted on the understanding that the Central Asiatic Expeditions would

terminate. This was followed by the discovery of entirely new fossil fields of Pliocene age to the east of the Kalgan Urga Trail; it was this discovery which led the American Museum to request a renewal for the present year 1931 and for the coming year 1932.

At this point a brief recital, by the leaders Andrews and Granger, of what has been accomplished by the American Museum may be given:

Dr. Roy Chapman Andrews has been unable to make arrangements with the Commission for the Preservation of Antiquities of Peking, China, for the continuation of explorations in the Gobi Desert by the Central Asiatic Expedition. For ten years this Expedition, under the auspices of the American Museum of Natural History, New York, has been making a general scientific survey of Mongolia, partly with the hope of finding the birthplace of the human race. Its researches have opened a new volume in the history of world life. It has spent half a million dollars in the country and has in every way conformed to local customs and restrictions. When its work was first started in 1921 it entered into an agreement with the National Geological Survey of China in which it was expressly stated that the Expedition was free to work in Mongolia. The terms of this agreement have been scrupulously kept by the Expedition.

The Central Asiatic Expedition was organized in 1920 and the advance guard (Messrs. Andrews, Granger and Pope) reached Peking and established headquarters there early in 1921. Since then the Expedition has made five summer explorations in the Gobi Desert (1922, 1923, 1925, 1928 and 1930). The only paleontological work done outside of Mongolia was three winters' work (1921–1922, 1922–1923 and 1925–1926) by Mr. Granger, at Wanhsien, a locality which was turned over to the Central Asiatic Expedition by the Geological Survey of China because they could not, on account of disturbed political conditions, investigate it themselves. The only archeological work done by the Expedition outside Mongolia has been an investigation by Dr. Nelson (1925–1926 and 1926–1927) of the Neolithic Culture found along the banks of the upper Yangtse River.

In 1928 our Expedition went to Mongolia under permission obtained for us by the American Minister from Chang-Tso-Lin, who was then in command of Peking. Our first contact with the Cultural Society came in the autumn of that year when we attempted to bring back to Peking our season's collection. The transport of our cases was blocked at Kalgan and it required two months of negotiations and the payment of a ransom collection of American fossils to finally get them free. In 1929 the Expedition was prevented from taking the field because of our inability to meet the demands of the Society. In 1930 these demands were modified to such an extent that the Expedition found it possible to accept them and our fifth Gobi exploration was carried out. It was agreed that year that this would be our last expedition but because of the important Pliocene deposits discovered in the Eastern Gobi it was desired to continue for one or two years more in the hope of achieving the chief aim of the Expedition, *i.e.*, the discovery of remains of ancient man.

Points to be emphasized are the following:

(1) Not a single specimen of any historical or archeological value, aside from Neolithic flints, has ever been taken from China or Mongolia by the Expedition, and these flints are still to be found strewn over the surface of the Gobi in millions.

(2) The great majority of fossils obtained have come from Outer Mongolia—a territory over which China relinquished the last vestige of control before our first trip there in 1922.

(3) It was arranged at the beginning of the Expedition that duplicates of all fossils would be returned to the Chinese Geological Survey. This arrangement has been lived up to and already the Survey Museum has been much enriched by duplicate specimens thus returned, and eventually there will be in China a very adequate representation of the collections made by the Expedition in Mongolia. Also, examples of all types of Neolithic flints have been given to the Survey Museum by Nelson.

(4) The Central Asiatic Expedition has always paid its way—spending a very considerable sum of money in China, also it has always worked openly, putting its cards on the table before each trip and at the close of the season announcing in public meetings in Peking (called usually by the Paleontological Society of China and held in the Survey Library), and in the press, the full results of the season's work.

(5) Those of us who have been associated with this Expedition can not help but feel that the presence of the Central Asiatic Expedition in China, with its personnel of talented men, has been an inspiration to Chinese scientists, and that the Expedition has been an incentive to the Chinese to do something for themselves along the same lines. In other words, we feel that our presence in China has been a benefit rather than a detriment to the country as a whole.

(6) The Expedition has not looted! It went into China in 1921 with the approval and cordial assistance of the Chinese scientists in Peking and their cordiality continued until 1927 when the self-constituted body, calling itself the Cultural Society, came on the scene and proceeded, by false representations, to turn the public against us and eventually the scientists of China, in self-defense, have had to follow suit.

The principal discoveries of the Central Asiatic Expedition are as follows:

(1) The discovery in 1922, and the development (1922–1930) of one of the world's great fossil fields, with no less than twelve distinct faunas—Lower Cretaceous to Pleistocene.

(2) The discovery of dinosaur egg nests, and of the complete skeletons and remarkable growth series of skulls of the animals which laid the eggs.

(3) Discovery of Cretaceous mammal skulls and associated parts of skeletons. The only Mesozoic mammal skulls known except *Tritylodon* from South Africa.

(4) Much additional information regarding *Baluchitherium*, the world's largest land mammal.

(5) Discovery of *Embolotherium*, a new phylum of Titanotheres and the most unusual and distinctive animal discovered by the Central Asiatic Expedition. The extraordinary development of the nasals in this creature is unparalleled in modern or extinct forms.

(6) Discovery of new phyla of Amblypoda and the extension of this order to mid-Oligocene time.

(7) Discovery of a great deposit of the shovel-tusk Mastodon, *Platybelodon*, with a remarkable series of specimens showing growth stages from foetal young to old age.

CONCLUSIONS

The arrest of British, French, Swedish and American paleontologic and archeologic work in Central Asia constitutes a very serious setback to the cause of science and of civilization. The matter would not be so serious if there were any possibility or prospect of the present ability of the Chinese to carry out this work themselves. They have neither the scholarship nor the financial means of doing so beyond the confines of old China. The American Museum geologic, paleontologic and stratigraphic and topographic work in Mongolia and the great publications issuing therefrom have been possible only because the party was composed of a body of field experts such as has never been brought together before in the history of these branches of science, under a leader who has shown unprecedented ability to organize a series of expeditions into an absolutely unknown desert where all previous explorers had failed either to make discoveries or obtain substantial results.

Our first knowledge of the paleontology of China came from fossils purchased in apothecary shops; for hundreds, perhaps thousands, of years fossils have been collected in various parts of China and ground up as medicine under the belief that they represent the remains of dragons. The American Museum expeditions have been among the first to dispel this nation-wide superstition, and American institutions of medicine have been advancing the true art of medicine throughout China. It is these very fossils, valueless in themselves, priceless in the knowledge they yield of the past history of the earth, the collection of which the Peiping Commission is now arresting.

The friendly effort of the American Museum to train up a body of young Chinese who would establish the extremely difficult sciences of field geology, vertebrate paleontology and prehistoric archeology under the auspices of the proposed Natural History Museum of Peiping has been brought to a full stop by the ignorance and anti-American prejudice of the Society for the Preservation of Antiquities.

This arrest of Central Asiatic exploration and research will cause world-wide disappointment and regret, especially among those who have been sincerely desirous of soundly establishing these great branches of science in China. The Commission for the Preservation of Antiquities must, therefore, bear a heavy weight of responsibility for the retardation and finally for the arrest of scientific researches and explorations in Central Asia, whereby China is placed in the column of backward, reactionary and non-progressive nations.

OBITUARY

ALDRED SCOTT WARTHIN

ALDRED SCOTT WARTHIN, student of disease, came into medicine by way of music. An artist he remained throughout life in the intensity and the individuality of his impressions. It was fitting that his first research should deal with the physiological effects of music and his last with the coming of death to the physician as depicted in art. His work on morbid anatomy, clinical medicine and experimental pathology was done with a sensitive recognition of the actual, but from it he derived convictions that were passionately held.

Born in Greensburg, Indiana, in 1866, Dr. Warthin gained a teacher's diploma at the Cincinnati Conservatory of Music in 1887, an A.B. at the University of Indiana in 1888, and graduated in medicine at the University of Michigan in 1893, becoming doctor of philosophy by the way. He was organist in churches to help himself through. The next four years he spent in the study and teaching of internal medicine at Michigan, with some months in Vienna and Freiberg. Then, turning his abilities to pathology, he became within six years Professor and Director of the Pathological Laboratory, taking his place amongst a brilliant faculty. There he remained, happily striving with the opportunities created by his diverse talents even more than provided for them, until his death on May 23, 1931. In 1900 he married Katharine Angell, herself a physician. He was made doctor of laws by the University of Indiana in 1928.

Dr. Warthin early decided that morbid anatomy was not the worked-out lode that many deemed it. Nor was it for him. The material at his disposal then and for some years after was meager, but for this he more than compensated by an intensive scrutiny. Rare was the post-mortem examination at that time to which he did not give three entire days. And overlooking nothing, finding a theme even in the pathology of the pacinian corpuscle, he became aware of the small signs of things that mattered largely.