designed to explode wet gun-cotton, the bureau has under consideration a plan of a piece which is intended to project an aerial torpedo, charged with a hundred pounds of wet gun-cotton, to be exploded over or upon an enemy's deck.

RECENT RUSSIAN GEOGRAPHICAL EXPLORATIONS.

AT the meeting of the physical section of the Imperial Russian geographical society, held Dec. 9, mention was made of Melnikow's archeological researches in the district of Troitzk and in the province of Mohilew. A few tumuli and prehistoric buildings had been examined, among which Melnikow claimed to have discovered cromlechs. Professor Sorokin travelled in central Thian Shan from Wernoje to the Issyk-Kul, thence by the Ula-Khom Pass to the Naryn valley, and by Mart Pass to Na-Manghan in Ferghana. Old buildings were found on the shore of the Issyk-Kul, but no traces of any under the water. Limestones of very new formation were discovered in the lake. Professor Muschketow gave a *résumé* of Konshin's travels in the steppe east of the Caspian, including a part of the old beds of the Amu-Daria, which was followed by an interesting discussion in regard to these beds.

At a later meeting of the society, Dec. 17, Mr. Lessar read a communication on the country and tribes on the Afghan frontier. He first recalled his remarks made last year, that the only means of thoroughly subduing the Turcoman steppe was to annex Merv, and that it was comparatively easy at that time on account of the prestige of Russia. His expectations had been more than realized, as not only Merv had been peacefully annexed, but the country of the Saryks, southern Turcomania, had submitted. The peaceful annexation of Merv was said to be partly due to the conviction of the people that they would never have peace while there was not a power strong enough to enforce it, and that Russia was this power. After the subjection of Merv, the Russians came in contact with the Saryks, who had been hitherto very little known. Lessar found a great difference between the natives of Jalatan, near Merv, and of Pende, which is farther south. The former are very poor, not even possessing the commodities most prized by nomads, viz., good field-tents, fast horses, etc.; while this kind of wealth is more abundant in Pende. The people are not entirely nomadic, but know something of agriculture. They make use of artificial irrigation, though their method of storing and conducting water is very crude, and they know nothing of levelling. Lessar made the interesting discovery that the mountains in the south are very low, and composed of soft strata; while the same chain is much higher and steeper to the west and east. The Salors, a small tribe living near Merv, are very poor, the probable reason being the long cessation from robbing expeditions, while agriculture and stock-raising are rendered insecure by the incursions of their neighbors. A. WOEIKOF.

EMMERICH ON THE CHOLERA BACILLUS.

THE *Lancet* of Dec. 27, 1884, gives a very interesting *résumé* of a paper by Dr. Rudolf Emmerich, which is to be published in the forthcoming number of the *Archiv für hygiene*. The remarks are taken from advance proofs, and the original article has not yet reached us. The observations were made during the epidemic in Naples, and at the instance of the Bavarian government.

Dr. Emmerich did not limit himself to observations upon the comma bacillus, but attempted to discover other organisms by means of various culture-media and methods. He procured blood upon a sterilized platinum needle from the median vein of a young woman in collapse from cholera, and about six hours before death. He inoculated ten tubes containing nutrient gelatine in three places each, and found organisms in three of them, the other seven remaining sterile.

The organisms were all of one kind, cylindrical, with rounded ends, and occurring singly or in pairs, the length being about one and one-half times more than their width. They grow at ordinary temperatures in slightly alkaline nutrient gelatine, which they liquefy in solid opalescent patches. Under a low power ($\frac{100}{1}$), the colonies in the deeper portions of the gelatine present the form of a hone: those more superficial are like flat, circular mussel-shells.

The deeper colonies are yellowish brown by transmitted light, white by reflected light, and are finely granular. Those on the surface are pale yellow in the centre, whitish at the margin, and spread over the gelatine in a film.

These organisms were cultivated from the blood and from the internal organs of nine persons dead of cholera. They were most numerous in the kidneys and liver, then in the lungs, and least abundant in the spleen. They were found in sections of the intestines and kidneys (other organs not yet examined), and in very large numbers in the dejections and intestines after death. They grew in every culture experiment with alvine cholera material, whereas the comma baccilli only occurred in some cases.

Inoculation experiments were made at the Hygienic institute of Munich in conjunction with Dr. Sehlan. The animals used were mostly guinea-pigs, and symptoms were produced similar to those of cholera. The changes noticed varied from a simple desquamative catarrh, with rice-water-like intestinal contents, to hemorrhagic exudation, and destruction of the mucous coat.

The inoculations were made by the injection of two drops of a solution of a portion of a pure culture the size of a pin's head in two drams of water into the lungs, or subcutaneously. This produced an illness of from five to six days, with marked changes in the intestinal mucous membrane. The injection of a large quantity produced death in from sixteen to thirty hours, but with much less marked changes in the intestines.

The publication of the full paper is awaited with

very great interest. At present, and before we know the exact conditions under which the experiments were performed, it is impossible to form a correct judgment as to their value. The number of repetitions, and, in fact, all the details of the work, are needed in order to a just estimate of its correctness.

THE SCIENTIFIC PRINCIPLES OF AGRICULTURE.

Under the will of its founder, the Sherardian professor of botany in Oxford university was to hold also the Sibthorpian professorship of rural economy. The duties of both, but of the latter more particularly, were performed by Dr. Daubeny while he held this honorable post. His immediate successor, we suppose, gave his attention to the botanical chair; and the present incumbent, holding the ancient Sherardian professorship only, will doubtless give a fresh impulse to botanical study in the university. Under a chancery decree, the Sibthorpian professorship of rural economy is now independently established, and its duties defined "to lecture on the scientific principles of agriculture;" the amount of service is raised from 'one public lecture in each term' to twelve lectures annually; and Dr. Gilbert, for forty years the associate of Mr. Lawes at Rothamsted, and still so associated, was called to fill the chair. The continuous and well-concerted work done by these two men during the last forty or fifty years is now fairly well known and appreciated in all scientific circles; thanks, especially, to the extensive publication of a great part of the results in the Transactions of the Royal society. Mr. Lawes began his systematic investigations, we believe, while he was an undergraduate, more than half a century ago, by experimenting with manuring substances upon plants in pots; and when in 1834, on attaining his majority, he came into hereditary possession of the manor of Rothamsted, he at once set on foot the systematic experiments which are still in progress. It is understood that he has made ample provision for their continuance in the future. Although it could add nothing to his scientific fame, it was in fitting recognition of his services to his country that this inheritor of a handsome landed estate and a noble old manor-house was recently made a baronet. Equally fitting it is that Dr. Gilbert should now be called upon to present, in comparatively untechnical form, the general results and applications of his accumulated knowledge, and to inform the minds of those who will in great part become landlords, or country clergymen, or statesmen, to whom such instruction will form a proper and a very important part of a liberal education.

Dr. Gilbert's numerous scientific associates and personal friends in the United States, and not least those who had the pleasure of meeting him during his two visits to this country, while they read with interest the inaugural lecture delivered last spring, are hoping to have before them, in due time, the remainder of the course so happily begun, also its prospective continuation, to take the place in our day which was filled forty years ago by Johnston's lectures on agricultural chemistry and geology. 'A good deal has happened since then,' of which Dr. Gilbert can give excellent account. As an introduction to such an account, and to a popular exposition of the results attained during this interval, — much of it at Rothamsted, — nothing can well be more fit than this inaugural lecture. Agriculture is well said to be 'the concentrated production of food;' and the scientific principles upon which improvements in the art of concentrated production depend are drawn from the chemistry of the soil and atmosphere, and the chemistry along with the physiology of vegetation and of animal life. Of course, the subject will be treated by the present Sibthorpian professor from the chemical side. In this lecture the history of the subject is sketched from Saussure's analysis of plant-ashes in 1804, and Priestley's discovery of oxygen and of its liberation by growing plants, down to the researches of Liebig and Dumas, and ending with a sketch of the systematic field and laboratory work which has been carried on now for forty years by Sir John Lawes and himself. For the details of these prolonged experiments, and the full discussion of the results, see the elaborate memoirs published last year in the Transactions of the Royal society of London.

Introduction to the study of the scientific principles of agriculture: being the inaugural lecture delivered May 6, 1884, at the University museum, Oxford. By Joseph Henry Gilbert, Ph.D., LL.D., Sibthorpian professor of rural economy, etc. 47 p. 8°.

CHADBOURNE ON INSTINCT.

Prof. P. A. Chadbourne's Lowell lectures on instinct have reached a second edition; but the author has neither seen reason to alter the statements of the first edition, nor found time

Instinct: its office in the animal kingdom, and its relation to the higher powers in man. By P. A. Chadbourne. [Second edition.] New York, *Putnam's sons*, 1883. 323 p. 12°.