

The Ramsay Memorial Laboratory, University College, London.

THE new Chemical Engineering Laboratory at University College, London, founded as a memorial to the late Sir William Ramsay, was opened on November 12 by H.R.H. Prince Arthur of Connaught, accompanied by Princess Arthur. There was a large gathering, including Lady Ramsay and representatives of university, professional, and industrial circles.

Sir Robert Robertson from the chair emphasised the need, felt especially during the War, for men trained in the development of chemical operations to the industrial scale. He laid stress on the necessity of thorough preliminary training in chemistry, physics, and mathematics, and also on the need for whole-hearted co-operation between the industries themselves and the new department, in providing facilities for students to extend their training to include actual works practice and the investigation of problems on a manufacturing scale. He stated that he noticed recently in America that it is possible for the universities to maintain a small colony of post-graduate students at the factories, working on fundamental plant problems, and that this arrangement seems to work to the utmost advantage of both students and manufacturers. He urged chemical manufacturers in Great Britain to consider the possibility of similar co-operation.

Prince Arthur of Connaught, in declaring the Laboratory open, sketched the history of the Ramsay Memorial Scheme, which has now been carried to completion. The new Laboratories—which are temporary—have been reconstructed and equipped under the guidance of Prof. E. C. Williams. In addition to the funds handed over by the Ramsay Memorial Trustees, the Laboratory has received generous support from many of the great British chemical firms, which, by subscriptions for a period of five years, have ensured a minimum income of 1400*l.* Further support is still needed to enable the Laboratory to rise to its full powers of usefulness to industry.

Mr. W. J. U. Woolcock, president of the Society of Chemical Industry, said that although there has, in the past, been some doubt as to the value of the chemical engineer, he looked forward to this pioneer laboratory, as a result of the course of studies which has been framed, sending out men who will play a great part in British chemical industry. He noticed with great satisfaction that Prof. Williams had laid stress on the planning of the large scale operations

with special regard to the underlying chemical and physical phenomena involved, as well as on the actual design and operation of the plant. He foresaw the Laboratory becoming a centre to which chemical manufacturers would send their fundamental problems for solution, and although Great Britain is an old and conservative country, in which tradition dies hard, he appealed to manufacturers to bear in mind the possibility of still further co-operation along the lines indicated by Sir Robert Robertson.

Prof. E. C. Williams, in describing the scope and facilities of the Laboratory, said that the chemical industries require men of the same high scientific imagination and experimental skill as have done such great work in the pure sciences, but they must be trained to apply these gifts to the problems and plant operations of chemical industry. In the Ramsay Laboratory, men would be encouraged to develop processes from the test-tube scale to the industrial scale, and themselves to work out the whole of the data necessary for efficient operation on a commercial scale. Chemical engineering is essentially a quantitative science. Provision is made in the Laboratory for carrying forward investigations to the semi-industrial scale; a special laboratory has been built for this purpose, in which students can erect any plant they desire to their own designs and to meet their own special requirements.

A vote of thanks to His Royal Highness was moved by Sir John Rose Bradford and seconded by Mr. Roscoe Brunner.

After the ceremony, the Laboratory was thrown open for inspection. In addition to chemical and physical laboratories, there are provided a drawing office, mechanics shop, which is available for the use of students, and an industrial laboratory. The guiding principle in the design of the Laboratory has been flexibility. This is particularly apparent in the industrial or semi-large scale laboratory, where structures, services (including steam, gas, water, power, electricity, vacuum, and compressed air), and equipment are designed to give the greatest facility in the erection and operation of any desired experimental plant. The Laboratory is already well equipped with plant planned for quantitative investigation rather than for the illustration of industrial practice, it being felt that the latter can only be satisfactorily obtained at an actual factory.

Innermost Asia: its Geography as a Factor in History.

SIR AUREL STEIN delivered the first "Asia Lecture" before the Royal Geographical Society on November 3. He chose for his subject an account of his three expeditions to the Tarim Basin in Chinese Turkestan, which he undertook in the years 1900-1, 1906-8, and 1913-15. Sir Aurel has long held a foremost position as an archaeologist and explorer. We well remember, many years ago, his interesting investigations into the identity of the site of Mount Aornus, described by the Greek historians, somewhere to the north of Attock, which Alexander the Great besieged on his way to India. Since then he has gone much farther afield, and his chief work has been in Central Asia.

The scene of these explorations lies in the great drainageless basins situated between the Tien-Shan, or "Celestial Mountains," on the north, and the Kun-lun ranges to the south which separate them from Tibet. To the west it abuts on the great

mountain masses of the Pamirs, and on the east is bounded by the Nan-Shan forming the watershed towards the Pacific Ocean. This vast area is some 1500 miles long from east to west, and up to 600 miles wide from north to south. But "ground capable of settled life is strictly limited to strings of oases and only a few of them in the extreme east and west offer enough arable soil to support a population of some size. The rest of the area is occupied by huge stretches of desert . . . almost everywhere devoid of water."

This desert differs from the deserts of Arabia and South Africa, where whole tribes move about, sure to find grazing for their flocks, at least at certain seasons of the year. Such is not the case in the deserts of the Tarim Basin, where "the absence of moisture bans not only human existence, but practically also all animal and plant life," and what life there is, round the scattered oases, is entirely de-

pendent on irrigation derived from the water of glacier-fed rivers, which, if not artificially caught, rapidly disappears in the sand. This absence of atmospheric moisture is due to the immense distance which separates this region from the sea, and the high mountains which intervene on all sides.

The importance of the Tarim Basin lies in the fact that it was in the direct line of communication which once formed the great trade route between China and the West. Two thousand years ago it seems to have been the only means of interchange of commerce between the Far East and the West. Not only does the shortest route lie along it, but also the way to the north was barred by the presence of the fierce and warlike Huns and the Tien Shan Range, while to the south the snow-clad mountains of Tibet and the Himalayas formed an impenetrable barrier. Formidable as the passage of such a desert must have been, it appears to have presented less difficulties to the Chinese than were likely to be encountered on any alternative route. These circumstances accounted for the control China found it necessary to assume over this far-extended line, which eventually reached to the Pamirs. This was at first of a political nature, but ended in complete military occupation lasting for a thousand years. Sir Aurel Stein has been able to trace over a long distance the remains of the old *Limes*, or defensive wall, erected at the end of the second century B.C., no doubt the ancient representative of our modern line of block-houses.

The reasons for the abandonment of such a route as this, and the evacuation of the former inhabitants, give rise to interesting speculation. Was it due to an alteration of climate bringing about excessive desiccation, or to some other cause? From the high state of preservation of records, and other materials, discovered by Sir Aurel, it would appear that the climate has not altered and is much the same now

as it was 2000 years ago, for such friable objects as were found could only stand the test of time in an extremely arid climate. If, then, the occupation of this area was independent of climate, it must have been dependent on irrigation, which in its turn was dependent on water derived from glacier-fed rivers.

The lecturer discovered several abandoned sites of human habitation which had been maintained by irrigation, but are now far distant from the terminal point of the river which formerly supplied them with water. This seems to show, as originally suggested by Sir Sidney Burrard, that the evacuation of this area was due to the diminution of water in the rivers and not to an alteration of climate, of which there is no evidence. The glaciers, probably the remains of a former ice-age, are known to be shrinking, with the consequent decrease of the water supply, which probably accounted for the abandonment of this important commercial highway. But while this seems to afford an explanation, it is not safe to rely entirely on it, as there is always the human element to be taken into account, and that is not so easy to gauge. The way in which the Chinese have held this region, throughout the long years of varied history, is a remarkable testimony to their tenacity of purpose. On more than one occasion it has been lost, generally on account of internal dissensions, only to be regained in more settled times, and is held down to the present day.

It is to be hoped that at some future time Sir Aurel Stein will give us some details of the contents of the documents he has found, and of other objects of interest. We may add that he was accompanied on his expeditions by surveyors of the Indian Survey, and that a series of maps on a scale of 1/500,000, and 1 inch to 4 miles, have been produced by that department as the result of his surveys. H. L. C.

Tropical Medicine in the Southern United States.

THE recent Conference on Tropical Problems at Kingston, Jamaica, has served to direct attention to the enormous interest which is taken at the present time in tropical medicine and allied sciences in the United States. This movement may be said to have started some thirty years ago when the States had to take control of the Philippine and Cuba Islands after the Spanish War; it became greater when it was decided to open the Panama Canal. The building of the canal was rendered possible by the genius of Gorgas, who applied in a practical way the discoveries of Ross and Manson. The scourges of yellow fever and malaria which had caused the complete failure of the French effort were successfully combated, and the canal was built.

A very important feature of the moment is that private concerns and corporations with estates and financial interests in the tropical zone are taking great interest in tropical medical problems. Some of these concerns have complete medical services of their own. The United States Fruit Company, for example, has a tropical medical service admirably organised, with branches in several Central American countries, Guatemala, Costa Rica, Honduras, etc. At the head of each branch or division there is a principal medical officer with an adequate medical and nursing staff in each division. The Company has built one of several up-to-date hospitals with splendid laboratories, X-ray departments, etc. Some of these hospitals are magnificent, and would adorn any big European or American city.

Several United States universities, as, for example,

Harvard, established departments of tropical medicine some years ago. Funds have been collected now to found a large and up-to-date tropical school at New Orleans, and to institute a professorship of tropical medicine at the University of that city.

New Orleans certainly seems to be from every point of view the ideal place for such a school; it is in one of the most southern parts of the States (Louisiana), and tropical diseases are far from scarce there; yellow fever used to be a scourge in Louisiana and other southern United States, and malaria is still common. It has intimate trade relations with Cuba, Mexico, and Central and Southern America. It has the most famous university (Tulane) in the south, and modern progressive scientific institutes.

The authorities of Tulane University have offered the university professorship and the directorship of the new school to Dr. Aldo Castellani, lecturer at the London School of Tropical Medicine and Director of Tropical Medicine at the Ross Institute. Dr. Castellani is known by his discoveries in connexion with sleeping sickness, yaws, and several other tropical diseases. It may also be remembered that it was Dr. Castellani who, some years before the War, devised and prepared the combined typhoid + paratyphoid, and the typhoid + paratyphoid + cholera vaccines which, after much discussion, were generally adopted by all the allied armies, instead of the simple typhoid vaccination. He has written jointly with Dr. Albert J. Chalmers a standard text-book on tropical medicine, which has run already into three editions.