philosopher Wang Ch'ung said, "The vital spirit of a dead man leaving the body may be compared to the cicada emerging from the chrysalis." There were also eye, lip, and umbilical amulets.

Dr. Laufer has a very extensive knowledge of Chinese literature and of folk-usage and beliefs, and as he has discussed the matters studied with Chinese savants, we have a remarkably complete and discerning monograph, which will appeal alike to connoisseurs, artists, ethnologists, and students of comparative religion and folklore. There are sixty-eight plates, six of which are coloured, and 204 text figures, most of which are reproductions of Chinese drawings. The Field Museum of Natural History is to be congratulated on the publication of a monograph worthy of its most important and interesting collection of jade objects.

A. C. HADDON.

FIG. 2.—Incense-burner carved from white jade in open-work, Ming period. From "Jade: A Study in Chinese Archæology and Religion."

TECHNICAL EDUCATION IN INDIA.[1]

A REPORT on the results of an inquiry into the relation of technical instruction in India to the actual requirements of employers, which has recently been published, contains some valuable suggestions on the industrial outlook in that country. The inquiry is, however, strictly limited in scope. The report is not concerned with the general question of technical education, nor with the organisation or improvement of local industries; it deals with the more restricted and definite question of the value of the instruction now provided in Indian technical institutes in qualifying the students of those institutes to undertake positions as managers, heads of departments, foremen, and assistants in engineering, and in some few other industrial works.

Extensive inquiries have been made from the heads of engineering firms in different parts of India and also from the directors of instruction and the managers of some of the principal schools and technical institutions, and the results of these inquiries are embodied in certain definite recommendations, which have for their object the bringing into closer relation of the teaching of the schools with the actual needs of employers. The writers of the report, whilst giving due weight to the views of British engineers and educational authorities, have wisely recognised the fact—too often overlooked—that the conditions of industry differ very widely in India and in Western countries, and that the character, disposition, and aptitudes of native students must be considered in any proposals as to their education and training. The endeavour to impose upon institutions in India methods of instruction which may be well adapted to European students has produced results which are by no means satisfactory, and those who approach the problem of education from a scientific point of view realise that the character of the student, which is a product of his environment, must be considered in all educational schemes, and that the conditions of his training must be adapted to his habits and surroundings. This fact is recognised by the writers of the report when, at the outset of their inquiry, they state:—"It is useless training a man in mechanical engineering who will not take off his coat and work, whose physique will not stand the strain, or whose social customs make manual work repugnant."

The efforts already made to organise and develop education in India have clearly shown that the native student has a strong preference for studies dealing with the theories and principles of his subject over those demanding severe practical work or protracted scientific investigation. In many of the higher branches of handicraft the Indian is proficient, and it is a matter of some regret that greater efforts have not been made to develop technical instruction along lines which would have improved, and given greater artistic value to, many of the native industries. That suggestion, however, opens up a subject beyond the scope of the inquiry with which the report deals. The main object of the Commissioners was to ascertain what arrangements can be made for systematic co-

[1] Report on the Inquiry to Bring Technical Institutions into Closer Touch and More Practical Relations with the Employers of India. By Lieut.-Col. E. H. de V. Atkinson, R.E., and Tom S. Dawson. Pp. 100. (Calcutta, 1912.)

ordination between the work of technical institutes and the needs of employers with a view to active cooperation in the interests of the students and employers and for the general welfare of the country.

To effect this desirable end, great importance is wisely attached to affording to students ample facilities for practical work, not only in school laboratories and school shops, but under strictly commercial conditions in engineering and other industrial firms. Among the causes of the partial failure of Indian students to obtain suitable employment after leaving the technical institute some of the employers who were consulted state that "in most cases students from technical institutions will not work with their hands, will not observe factory hours, ask too high wages for learning their practical work, and generally think they know everything."

It is a fact that in their desire to obtain employment, whether as engineers or civil servants, Indian students undoubtedly attach too great a value to their school teaching, and the Commissioners recommend that school instructors and school managers should make it clear to their students that they are totally unfit for any position of authority immediately on leaving the institute, and must gain, under appropriate conditions of discipline, practical acquaintance with the details of the work in which they hope to be occupied. "Otherwise," they state, "there will always be a large number of men who fail to go further than the end of their college course." This is sound advice, which is not altogether inapplicable to British students. It is satisfactory to gather from the report that the writers are of opinion that Indians "if possessing the necessary character, theoretical knowledge, and practical experience, have more than equal chance of employment in India with Europeans." This statement will be read with equal gratification by those who are responsible in this country for the government of India as by the natives concerned.

Among the valuable recommendations set forth in the closing pages of this report, the importance of practical work is repeatedly emphasised. "The education given in the institute," we are told, "should be essentially practical, be capable of being applied commercially, and not of such high scientific character as is often considered necessary in the West." It is also pointed out that the "best method of training men in mechanical and electrical engineering to meet the existing demand is by a course at a well-equipped institute, followed by an apprenticeship in works."

India is waking up to the necessity of developing new and important industries. For the supply of the machinery needed to equip the increasing number of cotton mills now being erected in India, there will be a growing demand, and endeavours are being made to meet this demand by Indian enterprise and skill. The number of bleaching and dyeing works must be gradually increased with the development of the textile industries; and if only qualified students can be found who have received an adequate training in the technical institutes, new fields of employment will be opened up for native workers.

The report shows how the school may help the factory, and how the factory may offer a continually increasing number of remunerative posts to the trained students of the technical school. In addition to the general recommendations, the report contains useful suggestions for adjusting facilities for technical instruction to meet the demands of employers in the various provinces of India.

RESEARCHES IN RADIO-ACTIVITY.

SEVERAL communications from the Radium Institute at Vienna are before us, and a few of the most noteworthy are here mentioned.

In one of the recent communications from the institute Dr. O. Hönigsmid gives the result of a fresh atomic weight determination from the bromide, which confirms the value, 225·95, previously obtained from the chloride. Two determinations by conversion of the chloride into the bromide and *vice versâ*, the method adopted by Whytlaw-Gray and Sir W. Ramsay, also gave practically identical results. In conjunction with E. Haschek, a spectrographic examination of the preparations for barium was made. The barium line 4554·24 was not seen, and it was calculated from the effect of the addition of known small amounts of barium that the standard preparations could not have contained more than 0·004 per cent. of barium. This settles the question of the purity of the international radium standard, and of the true atomic weight of radium. It is characteristic of the time and of the accurate researches radio-activity has called forth, that the atomic weight of radium should now be one of the best-known constants, and far more certain than that of uranium and thorium.

In another communication, Dr. F. Paneth finds that polonium resembles a colloid in that it does not pass appreciably through animal membranes or parchment paper. Radio-lead may readily be separated from polonium by dialysis, the crystalloid salts of lead readily passing through the membrane and carrying the radio-lead with them in unaltered proportion.

Some further results of H. Molisch bring out the harmful effects of the radium emanation on growing plants when it is present above a certain degree of concentration. In lesser amounts a slightly favourable action on the growth is sometimes observed. The injury is a permanent one, the organs of the plant being affected and the leaves falling off. It appears to work like a poison chemically upon the cells, and considering the minute absolute amount of the emanation, there can be very few poisons which would produce in such small quantity so far-reaching destructive effects.

A. Brommer discusses the influence of the partial solar eclipse of April 17, 1912, on atmospheric electrification. During the first phase of the eclipse a well-marked diminution occurred in the number both of positive and negative ions in the atmosphere, the latter decreasing more rapidly than the former, so that an initial excess of positive ions was converted into a deficit. As the sun's disc again became uncovered, the number of ions increased and regained nearly their initial values, establishing a direct influence of sunlight on the ionisation of the atmosphere.

Exner and Haschek describe an unsuccessful attempt to find spectroscopic evidence of the existence of ionium in the thorium-ionium preparations separated from ten tons of Joachimsthal pitchblende by A. v. Welsbach. A similar attempt, with the same negative result, by A. S. Russell and R. Rossi, with the Royal Society's ionium preparation, is described in a recent number of the Proceedings of the Royal Society (p. 478). In view of the estimated period of ionium being from forty to one hundred times as long as that of radium, both these preparations should have contained a considerable proportion of ionium, and the failure to detect in their spectra a single line other than those due to known substances raises very important and fundamental questions.

A. Kailan, in three papers, deals with the influence