

type of development. The practicability of this conversion is dependent on the use of other materials also possessing special properties, though of a different kind, which have led to the rapid rise to engineering importance of such materials as heavy water, liquid sodium and zirconium.

Finally, after referring to the new ceramic materials based on barium titanate, to the emergence of titanium as a structural material and to the recently discovered beneficial effects on the physical properties of certain plastics which result from their irradiation by high-energy particles, Dr. Willis Jackson emphasizes the growing interdependence of progress in chemistry, physics, metallurgy and engineering.

ARCHÆOLOGY IN THE BRITISH COLONIES

SIR MORTIMER WHEELER'S address to Section H (Archæology) is entitled "Colonial Archæology" and is a plea for the urgent need to safeguard cultural and, in particular, historical and archæological evidence in and relating to British Colonial territories. Sir Mortimer is especially concerned with territories of British East Africa—Zanzibar, Kenya, Uganda and Tanganyika—but he also gives evidence showing that the position is bad in the Somaliland Protectorate and Aden and scarcely less unsatisfactory in West Africa, so that by extrapolation it can be surmised that the conservation of cultural treasures is sadly neglected to a greater or lesser degree throughout all the Colonial territories of the British Commonwealth.

The examples quoted from East Africa make indeed a sorry tale. Sir Mortimer gives chapter and verse of priceless buildings, many of them mosques of unique features, that have been pillaged for one reason or another, often quite recently, and in some cases they have even been deliberately destroyed by public works departments to make way for new roads or to supply building materials. The situation is chaotic in that each Colony has its own regulations with regard to conservation, and even where the laws are comprehensive and sensibly framed, their interpretation or execution is often left to officials with many other pressing duties or to persons with little or no interest in the matter. Now and then the story is relieved by examples of excellent (and timely) work; but these bright spots in the pervading gloom are all too often due to the fortuitous hand of some exceptionally enlightened person who struggles alone amidst apathy.

In July last year a widely attended Conference on African History was held in London under the chairmanship of Prof. C. H. Philips, of the London School of Oriental and African Studies, and from the three-day discussion six resolutions were drafted: the outlines of African history could be reconstructed by the co-operation of historians and archæologists; this implies the adequate preservation of ancient and historical sites, monuments and documents, and the development of museums and public record offices; immediate government action and control is therefore needed in the various territories; ultimately departments of antiquities will need to be set up to plan field-work and publish results; record offices, with archivists to run them, will need to be improved or, in some cases, to be created; and as an immediate step, a school of history and archæology in East

Africa needs to be established on the lines of the British schools in Rome, Athens and Ankara. These resolutions have been sympathetically received by the Colonial Office, which is ready to be advised on these points by a committee set up by the British Academy; the committee is at present discussing the matter.

Sir Mortimer is of the opinion that finance is not the prime hindrance. He believes that the foremost need is to introduce an adequate antiquities law for each territory. Then the interpretation of the law must not be left solely to the governors and district commissioners; they must be guided by experts, who will in fact be the staff of a territorial archæological department. Such a department needs as an absolute minimum a director, one or more assistant inspectors, normally of local origin, a skilled local foreman, and a museum-cum-store in the charge of a trained curator. A skeleton staff of this pattern will not be over-expensive, for already many territories are bearing certain charges—for example, museums—often in an ill-organized way. But fundamentally the need is for an awakened appreciation by the general public, particularly those in the territories themselves, of the high priority of these problems. The African must be acclimatized to cultural values as much as to political and social evolution. What Lord Curzon did for India and what the French are already doing in their African Empire must be repeated in the British African territories. Though his address deals for the most part with a sorry record of shortcomings, Sir Mortimer Wheeler believes that the present British Colonial administration is concerned about the situation, and he looks forward to the time when good intentions will be translated into actual deeds.

THE RELIEF OF PAIN

PROF. A. D. MACDONALD, in his presidential address to Section I (Physiology), remarks that the problems of pain were discussed by the Section at St. Andrews during the final day of the 1939 meeting of the British Association. At that time the relief of pain by drugs was largely limited to opiates, though the late Dr. T. F. Todd discussed the value of intrathecal injections of alcohol in the terminal stages of malignant disease of the pelvis. His aim was to block sensation, if possible without destroying the motor pathways.

Since then, because of the many drawbacks to morphine, much research has been devoted to the modification of the morphine molecule and to synthetic substitutes in the hope of reducing the disadvantages of morphine. Much ingenuity has been directed to methods of comparative assay of analgesics; but their study in experimental animals is difficult and probably only of value as a screening measure, to be followed by tests on man in both laboratory and hospital. Many compounds have failed to fulfil their initial promises.

Perhaps the most interesting of the morphine derivatives of recent introduction are levorphan and dextromethorphan, and of the morphine substitutes pethidine and methadone, both of which may be regarded as stepping-stones to long series of related compounds. As a rule, when a derivative is found to be more powerful as an analgesic, it is more toxic and has other grave disadvantages. Pethidine itself has the support of the Medical Research Council