

may be offered on the non-technical aspect of these applications. In the first place, you will have seen that the popular use of the term "chemical-warfare" in connection only with poison-gas is erroneous: all modern warfare is chemical warfare and superiority is determined by capacity to manufacture and skilfully to apply chemical materials. In the second place, it is erroneous to regard gas-attacks as more inhumane than destruction with explosives or bayonets; probably this misconception is owing to the frightful results of such attacks on unprepared troops. After the first surprise and consequent elaboration of protective measures gas-attacks were far less destructive than bullets and explosives. This appears very clearly from the official casualty-lists of the American troops, who, coming late into the War, were fully prepared against gas. In round figures, 25 per cent. of all casualties from bullets and explosives resulted in death, while of those wounded by gas only 2 per cent. died. It is thus fallacious to blame Science for having made War, more inhumane. War is the most brutally inhumane agency imaginable and introduction of scientific methods only implies that the power commanding

superior inventiveness must ultimately prevail. The famous American naval expert, Admiral Mahan, who wrote a masterly and arresting book entitled "The Influence of Sea-Power upon History" was an American delegate at the Hague Conference of 1899, when several of the more prominent nations of Europe and Asia, including Germany, pledged themselves not to use projectile whose only object is to liberate suffocating or poisonous gases. The United States never signed the declaration, and Admiral Mahan stated his position in these words:

"The reproach of cruelty and perfidy addressed against these supposed shells was equally uttered previously against fire-arms and torpedoes, although both are now employed without scruple. It is illogical and not demonstrably humane to be tender about asphyxiating men with gas, when all are prepared to admit that it is allowable to blow the bottom out of an ironclad at midnight, throwing four or five hundred men into the sea to be choked by water, with scarcely the remotest chance to escape."

The subject needs clear thinking. To me, the criminal aspect of poison-gas lies in breaking the agreement not to use it.

The Place of India in Pre-History.*

THOUGH absolute dating in time is impossible in pre-history a geological chronology can be constructed, and at the time when man appeared glacial deposits were being formed in the north, while in the tropics corresponding climatological changes have resulted in deposits the relation of which to those further north is now being investigated.

The evolution of man's brain from lower to higher levels is reflected in the degree of perfection achieved in the tools he used and, as different types of tools form a sequence agreeing with the sequence of geological strata, they afford the best available evidence of the course of human evolution during the early Ice Age, human fossils being fragmentary and very rare.

In Europe the most primitive tools are called Eoliths or "dawn stones". From these tools, which are so crude as to be scarcely recognisable as such except to a trained eye, the sequence passes through successive stages of finer and finer workmanship in the process of flaking by which they were made, to more useful artifacts upto those of the Neolithic Age of polished stone which in its turn passed into the metal era. Each stage—Chellean, Acheulean, Mousterian, etc.—is named after a type station in Europe, and such cultural stages are well defined and easily recognisable. But the evolution was not smooth, for in Europe two civilisations are found to have alternated, fluctuated and finally merged as the peoples respectively advanced and dominated or fell behind, till at last they were assimilated the one into the other. The first of these groups is called the Core Tool People since they generally used as implements stone cores shaped by the striking off flakes. The second is called the Flake Tool People, since they used as implements flakes struck off from a core—a difference in method of manufacture involving a fundamental difference in psychology. It seems likely that the Flake

peoples of Europe were invaders from Asia and the Core peoples from Africa. The Mousterians were probably a mixture of the two, though there were later invasions from Asia during Upper Palæolithic and Neolithic times.

A somewhat similar history can be traced in Africa. But there the core technique was definitely dominant while the flake technique did not gain much hold except in the north, where Asiatic influence would be more readily felt. In China, on the other hand, all cultures so far studied are flake cultures, the earliest being rather Mousteroid in form but of a coarser type, though lately a core-pebble culture similar to that found in North India has been reported.

The special importance of India for the proper interpretation of the facts of pre-history lies in her position in the geographical centre for Europe, Africa, China and Java, as well as in the many artifacts known to occur there and in the Primate remains of the Siwalik deposits which give grounds for hope that humanid remains may eventually be found there also, especially in view of the hypothesis put forward by physical anthropologists that the strenuous climatic conditions resulting from the uplift of the Himalayas were deciding factors in human evolution.

Research in India is also needed to throw light upon the origin of the Asiatic invasions of Europe in Aurignacian and Neolithic times, for it is in India that the earliest proto-Neolithic tools of Asia seem to occur; while the apparent absence of true Asiatic flake cultures from India also calls for further investigation. Though Asia may open the door to a true concept of the pre-history of man, India holds its key.

* A brief summary of the lecture delivered by Mr. T. T. Paterson of the Yale-Cambridge India Expedition, on Thursday, November 28, under the auspices of the Archæological Society of South India, Madras.