

fects of propaganda on the minds of warring peoples have learned that actions speak much louder than words.

No whispering campaign could possibly have the power for setting up dissension, suspicion and fear that is stirred by the conviction that even one or two of the enemy have dropped from the sky in unknown locations.

If the Germans are able to divert even

a small part of the energies of the British, French, Dutch and Belgians into a campaign of hate against the foreign-born or "suspicious characters" and make Dutch shoot Dutch, French shoot French, and English shoot English, then the parachute troops provide Hitler with an extremely potent new weapon in his war of nerves.

Science News Letter, May 25, 1940

Dr. Shapley's discussion of this topic was most appropriate for the American Scientific Congress for the plates from which they were made were taken by Harvard in Peru. He also showed exceptionally fine photographs of a solar eclipse taken in Peru in 1936.

Science News Letter, May 25, 1940

ASTRONOMY

New Methods Will Change Accepted Distances in Space

Improvements in the Yardstick of the Universe May Change Estimates as Much as Thirty Per Cent

ASTRONOMY is improving its yardstick of the universe in order to make it a more accurate measure of vast astronomical distances. The improvement may alter some accepted astronomical measurements by as much as 30%.

This was the news reported to the Eighth American Scientific Congress by Dr. Harlow Shapley, director of Harvard College Observatory, the man who first succeeded in providing astronomy with this valuable measuring technique.

Essentially the method depends on the so-called "period-luminosity relationship" of Cepheid variable stars, a certain type of star which fluctuates in brightness and derives its name from the constellation in which this type was first found.

The relationship, first found during a study of the Small Magellanic Cloud, by Miss Henrietta Leavitt of the Harvard Observatory in 1912, is simple—the period in which a Cepheid variable dims and brightens is related directly to its intrinsic brightness. Dr. Shapley later found this was true of all Cepheid variables. Thus by studying the period of such a star, astronomers can learn its absolute brightness and by comparing this with its apparent brightness, they can measure its distance. The yardstick has been of tremendous value for once an astronomer has found a Cepheid variable in a far-off galaxy, he can learn its distance and thus that of the entire galaxy.

There are various factors which affect the apparent brightness of a star as observed from this earth, however, which, if not allowed for, render measurements inaccurate. Dr. Shapley has just finished a survey of some 300 Cepheid variables in the Small Magellanic Cloud to learn

what these factors are and how to allow for them. One of the important factors, he found, is that the light of a star is absorbed as it travels through this cloud to earth and thus may appear as much as half a magnitude less bright than it actually is. This was the first study of absorption ever made in an outside universe, although astronomers have made many studies of absorption in our own Milky Way. On an average, Dr. Shapley found, a star's light loses about a quarter of a magnitude in the cloud, but, of course, each star must be measured individually.

The thickness of a galaxy also affects a star's light (depending on whether it is on the near or far side) and a phenomenon known as "doubling," resulting from two stars in the same line of sight, also affects these observations.

Dr. Shapley estimated that because of this absorption and remaining uncertainties in the period-luminosity relation for the longest period Cepheids, the distances of some galaxies may be incorrect by as much as 30%. Relative distances will not be altered appreciably, however; nor do these studies require any major change in the accepted distances of the Magellanic clouds.

Dr. Shapley also called attention to the need for more study of the relations between period and luminosity for Cepheids of very short or very long periods, as well as the need for more dependable magnitude standards in the southern sky where many important studies of external galaxies are being made. Today's accepted magnitude standards have been established in the northern sky and comparisons of these southern stars involve the risk of a certain amount of error.

CHEMISTRY—MILITARY SCIENCE

"Sleeping Gas" (If Used) May Be Methyl Bromide

THE "sleeping gas" used by the Germans in capturing a fortress in Belgium—if they used such a gas—may very well be methyl bromide, a heavy liquid that produces anesthesia, paralysis and even death if it can be distributed in air in sufficient concentration.

This is the suggestion of Dr. Theodore Koppanyi, professor of pharmacology at Georgetown Medical School. Methyl bromide is a material available in millions of pounds quantities in any industrial country since it is widely used in chemical manufacture.

Distributed in a closed fortress or air raid shelter by a shell explosion or some other means, it is believed that a concentration of the chemical could be built up in the air that would be effective in putting soldiers to sleep. If enough were introduced it might kill them.

Instead of the methyl bromide, the Germans may be using some related compounds, such as acetyl bromide, propyl bromide, or other higher esters. All are heavy liquids.

The anesthetic properties of the bromides have been known since about the 1880s. Once they were used in medical anesthetic mixtures, but they have been largely replaced by better and more efficient chemicals in operating rooms.

The idea that acetylcholine could be used as the Germans are supposed to have used the sleeping gas is declared to be impossible. This chemical found in the human body is not only a relatively rare one but it is a crystalline solid. Scientists do not see how it could be put into a fortress or used otherwise effectively even if it were available.

Science News Letter, May 25, 1940

Among the fruits which Comanche Indians dried in the sun and stored were *persimmons*, wild grapes, wild plums, and fruit of the prickly pear cactus.

Cod-liver oil for medicinal purposes must be rendered from fresh cod livers immediately after the fish are caught, whereas technical grades can be produced with less trouble and more cheaply.