

# THE SCIENCE NEWS-LETTER

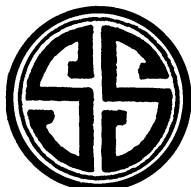
*A Weekly Summary of Current Science*

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## ALL WARS CHEMICAL WARS

All wars are chemical wars, even though poison gases are not used, and the victory goes not to the strong but to the ingenious and inventive. This is the keynote of an address delivered by Dr. Edwin E. Slosson, director of Science Service, before the recent meeting of the National Conference on International Problems and Relations.

Dr. Slosson said, in part:

"Wars are no longer fights between armies. They are contests between peoples. Nowadays the battle is not to the strong, but rather to the ingenious. It is quite likely that in the next war - if there is a next war - the decisive factor will be neither cavalry, infantry nor artillery, and it is quite possible that it will be something not yet taught in military academies or discussed in peace societies. It may be something as unexpected as were cavalry to the Aztecs or muskets to the Indians. Against such unknowables neither military preparedness nor peace treaty can protect in advance. The most effective forms of preparedness is scientific research and industrial development in general.

"The disconcerting feature of the new weapons of warfare is that they are concealed weapons. In January 1914, the Germans knew just how many dreadnoughts the British had, and the British knew just where the Germans had laid their railroads for the invasion of Belgium. But the Germans could not guess that the British would be rushing tanks through their lines, and the British could not divine that the Germans would be showering them with dichlorethyl sulfide. Nitroglycerin can be made in a kitchen from three common chemicals, and phosgene is no harder to make than hooch. Infernal machines can be secretly constructed by men who have no more sense than to be anarchists, and any skilful mechanic could rig up an automatic airplane capable of dropping fire, poisons and explosives on an enemy area. No international police could 'frish' a nation for concealed weapons of this sort. So limitation of armaments means merely that there shall be no more parades.

"Modern warfare, like modern manufacture, might therefore serve as a sort of intelligence test between peoples were it not for the fact that nations, like students, cheat in examinations. They loan their minds out as they loan out their money. The redskins of America, who belonged culturally to the Stone Age, were often armed with better rifles than our soldiers, and the Riffians use artillery and airplanes that they could never invent.

"Nowadays fighting is carried on with chemical formulas, and the nation that invents the best one beats. That Germany was able to hold out so long against encir-

cling armies was due less to Hindenburg than to Haber, who discovered how to extract nitrogen for explosives from the air that blew over the blockade.

"War has been virtually a branch of applied chemistry ever since the invention of gun powder, or even since the forging of the first steel sword from the ore. The question now pending is, therefore, not the elimination of chemical warfare but its limitation to the older and less effective forms.

"The aversion against 'villainous saltpeter', the stink-pot of the Malay pirates, and the Greek fire which saved Constantinople from the Mohammedans, is at bottom the same as the abhorrence excited by submarines, airplane bombing and poison gas in the late war. It is essentially a reaction against war itself. The modern weapons of warfare are more efficient but not more deadly or more cruel than the old. Cain killed Abel as dead as any man has been killed since, and no more ingenious means of inflicting suffering have been invented than those employed by Nebuchadnezzar in his campaigns. Further advance of the art of war in this direction is forever impossible.

"The methods of warfare changed so rapidly during the late war, that if the United States had been completely prepared in 1914 its equipment would have been out of date when the United States entered in 1917. A large part of the thirty-five thousand articles necessary to equip a modern army was of a type unknown when the Great War began. For war had for the first time in history entered the third dimension with airplanes above the surface of the ground, and submarines below the surface of the water.

"Now we are given to understand that the War Department knows where to go to get each item of 700,000 components of the military equipment needed, and arrangements are being made with 20,000 manufacturing plants of the country to supply them according to specifications. Against preparedness of such a sort even a pacifist cannot object.

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#### EVOLUTION SHOULD BE TAUGHT TO ALL STUDENTS, SAYS BOTANIST

Instruction in evolution for all college students is advocated in a recent number of Science by Dr. John M. Coulter, formerly head of the department of botany at the University of Chicago and now associated with the Boyce Thompson Institute for Plant Research at Yonkers.

There are at least three important reasons why evolution should be regarded as a necessary part of college training, Dr. Coulter says.

"It has revolutionized modern thought. Every subject today is being attacked on the basis of its evolution. Not only are inorganic and organic evolution being considered, but also the evolution of language, of literature, of society, of government, of religion. In other words, it is a point of view which represents the atmosphere of modern investigation in every field.

"It is persistently misunderstood. From the press, the lecture platform and even the pulpit, one frequently hears or reads amazing statements in reference to