THE REALM OF SCIENCE

William F. Rigge, S. J.

AMONG the many beliefs that are firmly rooted in the public mind is the one that it rains after every big battle. As the exact interval between the battle and the rain is a matter of no consequence, it is an easy task to prove the proposition.

Inquiring minds, however, go a step farther and after taking the truth of the statement as unquestionable, look about for a cause. Plutarch, nearly two thousand years ago, attributed the rain to the exhalations rising from the blood and the decaying bodies of the slain. Present day theorists say it is due to the smoke, and especially the loud noise of the cannonading.

What is to be held concerning this general belief? Is it true? And if true, what is the real cause of the rain?

It may come as a shock to most people to hear that the proposition is not true at all. The proof is simple. First, the elastic interval between the battle and the rain is enough to take away all certainty in their connexion. It must surely rain sometime after any event whatever. That fact cannot therefore be sufficient to make the given event the cause of the rain.

Secondly, the production of a rain over only a few square miles of territory involves an expenditure of millions and millions of horse-power of energy, far in excess of that of all the armies of a great nation. Let us examine a few figures.

To change the temperature of a pound of water one degree in one minute, requires a force of one-fortieth of a horse-power. To liquify a pound of water vapor, that is to condense the moisture in the air to rain, requires more than five-hundred times as much, that is, about twelve horse-power.

*Professor of Physics and Astronomy. The Creighton University, College of Arts and Sciences; Director of the Observatory.

One inch of rain would throw down about one hundred tons of water on each acre, for which, therefore, about two and one-half million horse-power would be necessary. One inch of rain over a square mile would demand about fifteen hundred million horse-power. There is no need to go further, and mention other necessary requirements, such as, to hint at only one, the practical application of the energies of an army's guns and other powers to the actual production of rain.

But does not the cannonading itself produce rain, the repeated and mighty concussion of the molecules of water vapor? First, it cannot do so in principle, because the power is too absurdly small. Secondly, it has never done so in practice, as ever so many experiments with explosives have unquestionably proved.

To what, then, is the general conviction due that it rains after every battle? This also is not far to seek. The maneuvering for a battle requires some time and must evidently be executed in fair weather. By the time the battle is fought, the fine weather is generally at an end, so that it is time to rain.

Does it rain after every big battle? It surely does if no time limit is imposed, but never as cause and effect.

Professor Julius Festner, Arts '12, who spent a year or more in Germany as American Vice and Deputy Consul in Barmen, and is now teaching in the Arts Department, has a very interesting article in *Science* for December 18th, on the Garbage Incinerator at that place. He says that the garbage is burned in seven large furnaces, and is its own fuel. The heat generated is used to produce electricity by means of steam turbines and dynamos, while the ashes form an excellent sand, the annual yield of which amounts to 11,000 tons. The whole plant is very economical and nets the city a handsome revenue.