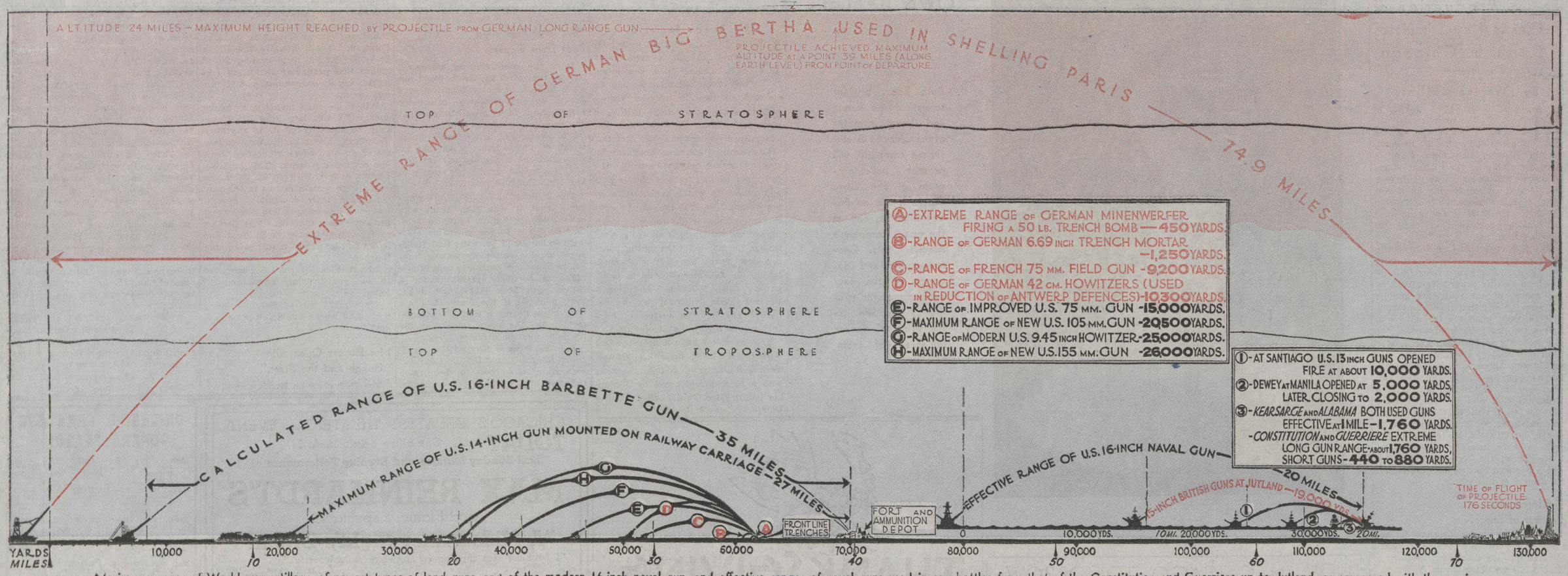
Graphic Section

Chicago Sunday Tribune

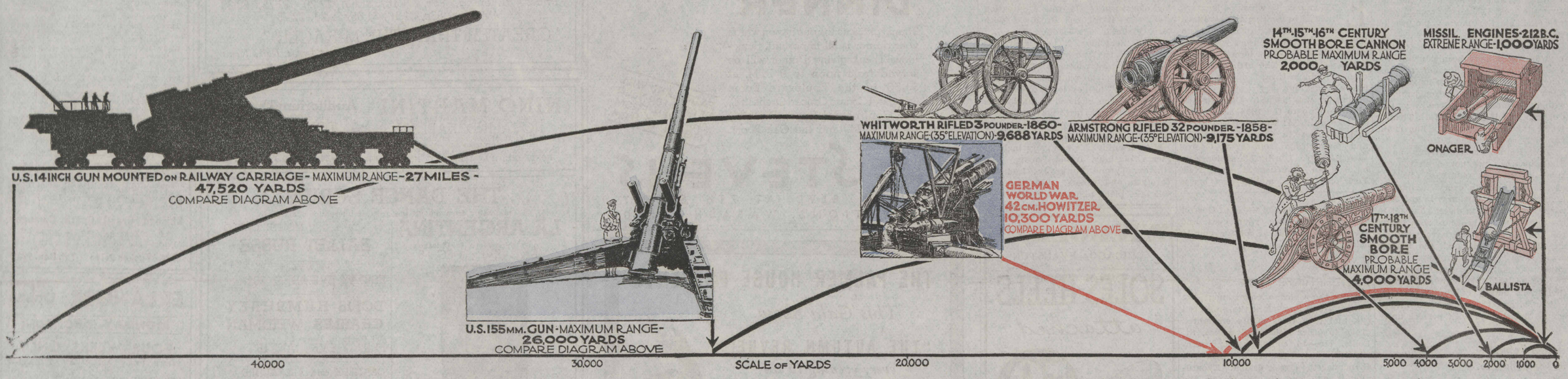
WORLD'S GREATEST NEWSPAPER

NOVEMBER 25, 1934.

Drama Music Movies Hollywood

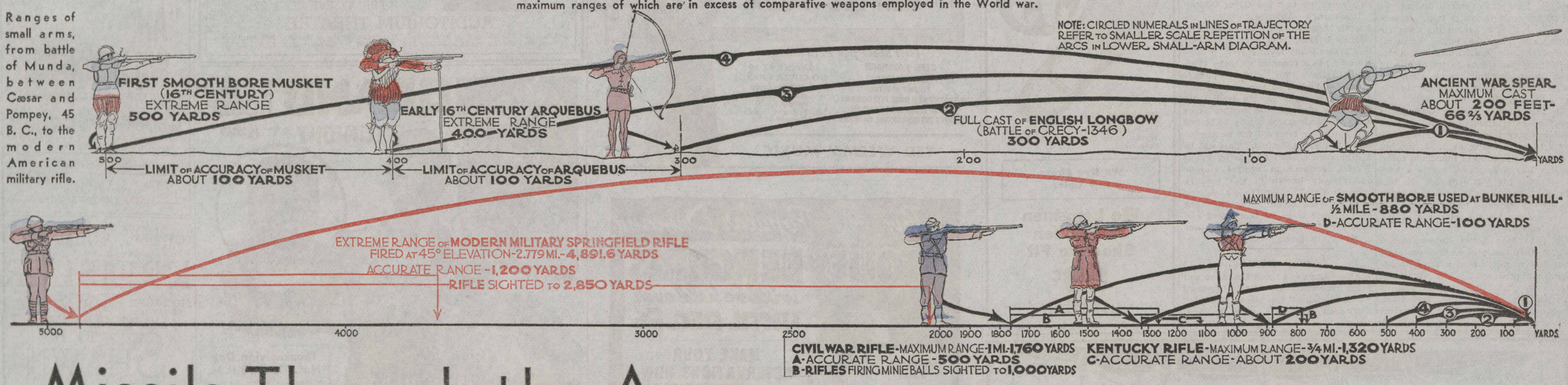


Maximum ranges of World war artillery, of newest types of land guns, and of the modern 16-inch naval gun, and effective ranges of naval guns used in sea battles from that of the Constitution and Guerriere up to Jutland, as compared with the maximum range of the German long-range gun that shelled Paris. In this and in the other diagrams World war figures and trajectories are given in red.



Examples of artillery typical of their times, and their respective ranges, from the ancient missil engines of 212 B. C. to the 42-centimeter German howitzers used at Antwerp in the World war, as compared with examples of America's most modern guns, maximum ranges of which are in excess of comparative weapons employed in the World war.

Ranges of small arms, from battle of Munda, between Cæsar and Pompey, 45 B. C., to the modern American military rifle.



Missils Through the Ages

By JOHN A. MENAUGH

ONCE upon a time—no one knows how many thousands of years ago—a hairy creature, half man, half ape, seized in his calloused hands a bowlder, or a limb of a tree, or possibly even a fragment of jagged ice, and hurled it with intent to kill. The projected object may have cracked the skull of another ape man or may have thudded harmlessly against the ribs of a woolly mammoth. Most likely, however, and for an obvious reason, it missed its mark entirely.

It was the world's first projectile propelled by man. It was the dawn of an idea—an idea put into practice in a spectacular and terrifying manner during the World war when the Germans shelled Paris with their long-range guns.

From the first missil of the brutelike cave man, with barely sufficient momentum to make it travel a few yards, to the streamlined shell of the Big Bertha, which started its journey of destruction at the speed of 5,260 feet a second, represents a period perhaps a hundred times longer than the total years of recorded history. During all of those centuries man was devising ways and means of casting missils in order to be able to slay the beasts of field and forest and to conquer his human enemies. Slowly and surely over the ages he increased the ranges of his missils, by feet, by yards, and by miles, until he had perfected a gun that would shoot a projectile in less than three minutes farther than a speedy horse could travel in a day or the average man's automobile in an hour.

The world's initial war came at a time long after the first employment of natural objects as missils and at a period when men already had begun to unite in groups for mutual protection. Perhaps they cared for hand-to-hand fighting no more than do warriors of today, preferring to slay their foemen at a distance. So rocks and tree branches were supplanted not only by swords, deadly weapons for close fighting, but by spears and the like, which could be cast effectively for considerable distances. The Roman legions of the time of Cæsar and soldiers of other military leaders far back in the foggy reaches of antiquity were hurling spears to cut down their enemies. The maximum range of a war spear was approximately 200 feet, for it was considerably heavier and more difficult to hurl than the modern javelin used in athletic meets, with which a record of 242 feet 10 inches was made in 1932 by Matt Jarvinen, a Finn.

Bow an Effective Weapon of Antiquity

Early warriors not only employed the spear or javelin as a missil, but used bows and arrows with even more deadly effect. The bow was invented in prehistoric times, flint arrowheads found throughout Europe and Asia indicating an age of from 25,000 to 50,000 years or even greater for that weapon. First wars of which we have any record had opposing armies shooting at each other with bows and arrows, yet as old as the bow possibly can be, it is comparatively modern beside the first missil hurled by the beastlike cave man.

Ancient bows were of many patterns. The crossbow, a development of the ordinary bow, which came into general military use in continental Europe early in the middle ages, depended upon a single, double, or even triple bow of steel to propel its bolt, a missil shorter and heavier than the standard arrow. The bolt of the crossbow delivered a heavy blow at close range but lacked the carry of the arrow of the ordinary bow. It was the Hundred Years' war that brought the bow to its point of highest development. At Crecy, for instance, in 1346, the longbows of the English archers outranged and outshot the crossbows of the Italian mercenaries employed by the French king. The English bowyer could release a dozen arrows in the time required for a continental arbalester to set his crossbow by windlass or lever and discharge a single bolt. Old manuscripts say of the English longbow of the fourteenth and fifteenth centuries that its full cast was 300 yards. That, it should be understood, was with an arrow with a sharpened steel broadhead point or with a bodkin point, a missil sufficiently strong and heavy to pierce armor at short range or fell a man at a distance almost as great as its maximum carry.

Arrows, of course, have been shot to distances greater than 300 yards, but in all cases they were specially constructed missils employed only for flight shooting. Mahmound Effendi in London in 1795 shot an arrow 482 yards. Ingo Simon in Le Touquet, France in 1914 shot an arrow 462 yards 6 inches. And no longer ago than 1933 Curtis Hill of Dayton, O., in a tournament in St. Louis shot an arrow the amazing distance of 518 yards. In doing so, however, he lay on his back, bent the bow over the soles of his feet, and released the arrow after a pull with both hands.

Over that lengthy period, covering uncounted centuries, in which armies were battling with swords, spears, and bows and arrows, there were developed weapons other than hand weapons that corresponded with artillery of modern times. These were the so-called missil engines, contraptions that hurled huge rocks or heavy bolts and were particularly designed for siegecraft. Missil engines were in use possibly as early as 1000 B. C., though really efficient types did not come into general use in warfare until approximately the third or fourth century before Christ. Archimedes, the Greek mathematician and inventor, really was the Krupp of his day, the missil engines he devised for King Hieron for the defense of Syracuse in the siege of 212 B. C. being far in advance of any weapons of that type ever built before. It was not the fault of the war engines of Archimedes that Syracuse fell to the Roman general Marcellus, for those great machines were capable of hurling rocks weighing several hundred pounds to a distance of 600 yards in direct fire or 1,000 yards in plunging fire.

Nature of Missils Changed by Gunpowder

Early war engines included the catapult, employing twisted fiber or hair for propelling power; the ballista, a large-sized catapult, and the onager, a machine employing the principle of the springboard for projecting missils. A small catapult had a range of about 400 yards, a larger and heavier one a greater maximum range. Missil engines took various forms as they were developed up to the time of the invention of gunpowder, though it is doubtful whether any of them had a greater range than the 1,000 yards of the superengines invented by Archimedes.

The introduction of gunpowder into the business of war in Europe early in the fourteenth century changed completely both weapons and missils, though the change was not so abrupt as might be supposed. For a long time, for instance, the old missil engines remained almost the equal of early cannon, and the longbow stood as superior to the earliest small arms employing powder. Cannon were invented before muskets and pistols. First cannon were called bombards and were nothing

(Continued on page eight.)