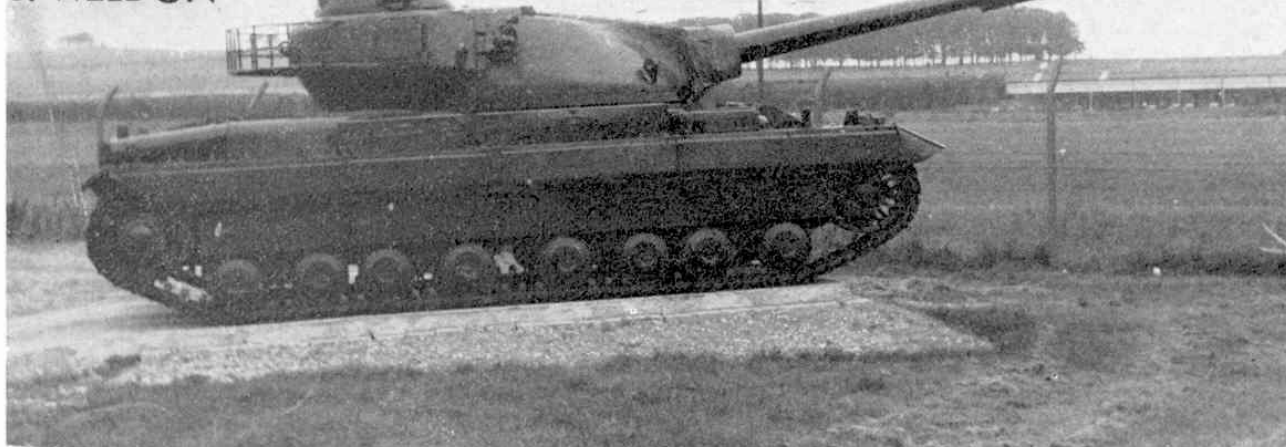


A SHORT HISTORY OF TANK DEVELOPMENT PART III

J. WELDON



CONCLUSION

The British big-gun tank of 1950, the Conqueror. This was slow, well armoured with powerful armament, but excessively short-ranged and careful parking was needed for accurate fire.

TANKS IN THE NUCLEAR AGE

MOST OF US HAVE the habit of dating things by the Second World War. Collectors of die-cast cars, or railway models, for example, nearly always do this, as you can see in the MM's advertisement columns. Things are 'pre-war' or 'post war'. Yet really, a whole quarter of a century has passed since that war ended.

When last month I ended my description of the "Struggle for Survival" with the arrival of the Centurion, I reached a point where time has appeared to stand still for tanks. For the Centurion is still very much with us, outwardly almost unchanged, 25 years after it entered service. A whole quarter of the 20th. century! The Centurion, indeed, appears to be immortal, as does the even older Sherman in its A 4 E8 modification. Just imagine a tank of 1918 still in use in 1943! Why, the very idea is fantastic. Who on earth could find a use for it? Yes, indeed, time seems to have stood still, or at least slowed down, for tanks after 1945: there are still plenty of Centurions in the British and foreign armies, and Shermans were used in Sinai in 1967.

However, if we study tanks closely we soon find that in this period of no-change there are 3 distinct periods, during which important changes were made both to their insides and to their employment.

The first was the period of the Nuclear Umbrella. For several years after World War Two, armour took time off from the military scene in the West, for many people really believed that big armies of World War 2 type would never fight again! If an enemy looked nasty—a threat of an Atomic Bomb would make him behave himself. One result of this, was that the U.S.A. and Britain tended to go slow on the development of tanks.

Of these, there were two main types, the Main Battle Tank and the Big Gun Tank, based upon the Soviet T44 and the Josef Stalin 3, both of which were improvements of pre-war designs, the T34/85 and KV, respectively. Both led current trends in that they housed big armament under a markedly lower silhouette, and the Josef Stalin introduced the idea of a near-prone closed-down driving position. Their equivalents in the West were the British Centurion and big-gun Conqueror; the French ARL 44 and big-gun AMX50; the American M46/47/48 Patton and big-gun M103. The Centurion, Patton and ARL44 were all wartime designs: the M103 began its life as the war ended, the Conqueror in 1948, and the AMX 50 about the same time, and of them all, the ARL (Ateliers de Rueil) was the most 'dated', having the highest silhouette and somewhat old-fashioned tracks.

All the MBTs had guns of between 83.4 mm calibre (Centurion) and 90 mm (ARL): the big gun boys, between 100 mm (AMX50) and 122 mm (Stalin). These may seem very much of a muchness, but a difference of a few millimetre in gun calibre means a big difference in weight of missile: a tank gun of 83 mm calibre throws about 20 lb: one of 120 mm throws 50 lb. The weight has gone up almost a pound for every millimetre diameter increase. And when you get up above 20 lb, you begin to leave the point at which the missile is "quick-firing"; that is, built like a pistol round, bullet and cartridge all in one package. Just try heaving a few 30 lb weights around in a confined space, and you'll see that the modern tank gunner needs strong arms! Above, say, 90 mm calibre, the ammunition must be loaded in 2 parts—first the

projectile, then the cartridge that sends it off, and this slows down the rate of fire, which is one of the reasons why the Russians made their big-gun tank as low and inconspicuous as possible.

In fact, they scored markedly here, with both MBT and BGT. Their T44 weighed only 35 tons against the Centurion's 50; and their Stalin only 45 tons against the Conqueror's 65. Except for the French tanks, those of the West were proportionately down on range and speed—the Conqueror, whose Rolls Royce engine gobbled 4 gallons of petrol per mile, had fuel for only 30 miles! It also had to stop to let its gun fire, and if it didn't park itself on the level, the fire was not very accurate.

The French AMX 50 differed from all the other big boys in having a much more powerful engine—1000 bhp—which pushed it around at speeds of up to 32 mph and gave it a range of action greater than any of its allies or potential enemies. It also had an interesting turret made in 2 parts. The gun was fixed immovable in the upper part, and this upper turret was hung on trunnions in the lower part. Thus, to aim the gun, the lower turret was rotated to get the right direction, and the upper turret tilted to get the right range. It was most ingenious, and gave steady shooting, but some NATO authorities said it would be liable to jamming, and its inside wasn't roomy enough.

Well, these tanks all soldiered on until the Second World War was eleven years behind—they had minor improvements, and the NATO powers were remarking that Russia hadn't improved her tanks for many years, and the current Western ones were really the better models, when—zip—the Hungarians tried to break out of Soviet slavery, the Red Army was sent in to crush them, and it was revealed that the Communists had been secretly developing a whole new approach to warfare—including armoured vehicles.

They had redesigned their MBT to serve in 'local nuclear war', and now called it the T54. It now carried a cannon of 100 mm calibre, was adapted to night driving, had a lower silhouette (and a lie-down driving position), a sleek rounded turret, was supposedly resistant to nuclear flash, blast and fallout, but still weighed only 36 tons. You see, the Russians argued that 'nuclear' war and 'conventional' war should be merged—the nuclear weapons being made small enough to use "locally". This meant that the armoured and all-mechanised formation must become the most important kind—in order to move and fight in nuclear-devastated zones. And in the foreseeable future, a nuclear shell would be made in, say 100 mm calibre—suitable for firing from a tank cannon!

NATO had to jump to catch up again. Conferences were called in order to decide quickly on a design for a NATO tank—but alas, the Western powers could not agree—France, for example, held out for fairly thin armour, with high speed and long range; while Britain said that speed was not so important as protection and gun power. There is something to be said for both. As the British argued, tanks will have to move mostly by night—so high speed is not so essential. They will lie in ambush through the day—so gun power is needed to reach everything in sight. In turn, this allows the power reserve to be used to carry extra armour.

Well—there was no agreement, and each of the major powers built its own tank. The Americans quickly produced the M60 modification to their existing Patton series, and thus were first on the commercial market—getting quite a few sales that way. The other powers designed from scratch, and by the early sixties the prototype Chieftain (Britain), AMX 30 (France),



Above: This is the German "nuclear age" Main Battle Tank of the late sixties. Note the sleek lines, the range finding and night navigation equipment and the "dustbin", fitted to enable the tank to deep-wade rivers etc.

Below: The "Chieftain" nuclear-age Main Battle Tank, which combined the armament of earlier big gun tanks with the dimensions and mobility of a main battle tank plus adaption to nuclear war. A very good protection against anti-tank weapons.



The French ARL 44, a little known tank of the years immediately after the end of World War Two.



Standardpanzer Leopard (West Germany) were appearing, as well as the Swiss Panzer 62. And here, Britain got ahead, mounting the biggest cannon of the lot—the Conqueror's 122 mm—in a stabilised, target following mount, in a low vehicle of good shape, using the lie-down driving position. The American, French and German tanks used a British gun, bigger than the Russian one, but smaller than the Chieftain's. It was the latest gun developed for an improved Centurion.

And these are the tanks in service today! The Big Gun tank is a thing of the past, for the MBT now carries its gun, in a better mount, at a higher speed, suited to local nuclear war. The massive Conqueror now features as a rather expensive target on gunnery ranges—just imagine shooting at a target that cost £60,000 when new! I for one wouldn't dare hit it for fear of spoiling it. A few have survived in various army camps—to become monuments to modern armour. The Soviets are more careful with their old tanks. They hire them out to their satellites and allies like Egypt. A lot of Josef Stalins met a grim fate in the Arab-Israeli war of 1967. As for the nuclear age MBT, its inside resembles a space capsule with all its electronic and blind driving and target following equipment. One feels that if only the exhaust blast could be directed downwards, the Chieftain could be placed in orbit.

Now, what of the Light Tank? During both the periods I have described, the French and the Americans continued to build them. The Americans were not very inventive. Their M41 was not very light. For all practical purposes it was a T34 of 1939 rehashed with American refinements. Gun, weight, engine were the same, but armour was a lot poorer. It was difficult to see a role for this tank, except as a commercial, sold to banana republics for internal security.

The French had also marketed a commercial 'light'. They got this on the market within three years of World War Two ending, and it sold well, for it carried a 75 mm gun while weighing only 14 tons. It was air-

The fast, well armoured French Big Gun Tank of 1950, the AMX 50. Note however the very high silhouette, and the complicated turret with cramped interior.

portable, and its chassis could be adapted to a number of roles—troop carrier, command vehicle, almost any type of self-propelled gun. As a tank it is now well out of date—although it fought in the 1967 Arab-Israeli war—but it is still a very good general-purpose chassis.

Obviously, a well thought out air-portable light tank might have been very useful to Britain and the USA in the various 'brush-fire' wars that have broken out over the last 25 years. But no such tank was available, the M41 not being an airborne type. When the trouble in Cyprus hit the headlines, a British Member of Parliament demanded that "our heaviest tanks be sent to Cyprus". How foolish! There was no work for the Conqueror there! But a fast airborne light tank would have been very useful—and there was no such vehicle. Which brings us to the third development phase.

In the mid-fifties the American Aircraft Armament had built a fast 18 tonner, armed with a 76.2 mm cannon mounted in an unusual way. However, it was a complex machine, the power reserve was not great, and the gun was of limited uses.

A better design came in the early 'sixties—the M551 Sheridan—a bit bigger, but lighter (made mostly of aluminium alloy), more powerful engine, and a much more useful gun of very large calibre, which fires everything from ordinary shells to guided missiles, and may have a nuclear potential. And it can be dropped by parachute, and motor straight into action. Its only drawbacks are said to be a rather high silhouette, and a smoky exhaust which can betray its movements. Britain has followed suit with this class of vehicle, and the aluminium Scorpion, very like the Sheridan, is under test. A tank long overdue!

Continued on page 514

however, and from then on Pat spoke all the Spanish, ancient Hebrew, and forgotten Berber dialects that we ever needed, and occasionally performed other miracles just to show there was no ill feeling.

A week after leaving England we crossed from Spain to Morocco, thereby fulfilling one of the main objects of the City University Africa Expedition—to reach Africa. The next thing was to get to the right part of it. Our plans involved making a number of preliminary studies of hydro-electric and irrigation schemes in Morocco before tackling the desert, and the first ten days in Morocco was spent doing this. For me, Morocco was both intriguing and disappointing. Intriguing because here was a different continent on which had evolved a different kind of civilisation under the influence of the Moslem religion. But disappointing because all the ancient splendour of Imperial Morocco was hidden behind the superficial mask of the tourist industry. Because Mo could speak Arabic, we were able to get to know several Moroccans, and when it came to buying anything, Mo could drive as hard a bargain as anyone in Fez, Marrakech or Casablanca.



Lost in a sea of sand—thousands of miles from home!

Having visited Dams near Tetoan and Marrakech and visited the old cities of Fez and Marrakech, we went to Agadir to prepare for the desert crossing. Old Agadir was destroyed by an earthquake in 1961, which killed most of its inhabitants. Now it is a brave new city and a thriving winter holiday resort. But there is no "atmosphere", and behind the concrete shells that were built as shops or houses, there is an eerie silence. Still after nine years many of the inhabitants who fled the city have not come back again, and the concrete shops and houses that were built for them are empty. We spent three days getting together supplies and giving much love and attention to Benji. On the fourth day we relaxed, and the following morning we set out for the Sahara desert, leaving civilisation behind us for the next 2,000 miles.

It was a bright but not entirely cloudless day, and there was a cool breeze coming in off the sea. Benji was now heavily laden, carrying all our gear, food for fifteen days, thirty gallons of water and forty five gallons of petrol. It was nearly three weeks since we had left England, and now suddenly the Sahara was becoming real to us after months of planning. We passed through Goullimine in the early afternoon, which has two large notices on the side of the road proclaiming "Gateway to the Sahara" in Arabic and French. Then Tan-tan eighty miles further on, and Tan-tan Plage, a collection of Bedouin tents and a small airstrip which is used by personnel going out to an Esso oil rig, some sixty miles off shore.

At Tan-tan Plage, the already narrow road ended abruptly. We had a short farewell service for tarmac roads with Benji's back wheels on the tarmac and his front wheels already three feet into the Sahara Desert, and then set off into the sunset. Had we been the

heroes of some great feature film one might well have expected "The End" to appear magically above Benji at this point followed by some curtains and "God Save The Queen" as he disappeared into a cloud of dust. But although it was picturesque, it was really only the beginning.

The map illustrates the desert crossing. Tan-tan Plage at the top of the map is nearly 200 miles south of Agadir.

At first the track we followed was reasonable, we could move at about 15 miles per hour. After the first few miles it began to get tricky however, and our speed was reduced to walking pace many times. We stopped when the sun finally dipped into the Atlantic on our right. There was quite a wind coming in off the sea, and as the hot day changed to the cold night, the air started to deposit salt on everything. By ten o'clock we all felt sticky and uncomfortable, and the severe water rationing we were on meant virtually no washing. Furthermore we were apprehensive; having covered seven miles in three quarters of an hour, we averaged just under ten m.p.h. If the desert was to be like this all the way, it would take three weeks to cross on a 100 mile a day basis, which would be pushing it!

The next morning we made an early start, being determined to cover a good distance, but the going was slow. There were several large creeks we had to cross, which meant detours of up to one mile. In places there was soft sand and we often needed Benji's low ratio four-wheel-drive ability to keep going. All this meant our petrol consumption was way above what we had anticipated, and this brought the point of no return nearer and nearer. To add to it all, we saw two or three old cars that had become hopelessly stuck. Their drivers having abandoned them, they lay helpless baking in the sun. We were driving along a coastal strip, the sea on our right and the steep side of an escarpment on our left. Very little vegetation grew here, the most common thing being an apparently lifeless grey cactus plant. In the early afternoon the hills on our left gave way to a gently rolling plane, and by about three p.m. we reached our first sand dune. Here we stopped to celebrate, because the track had got just a little easier, and Pat had created a new land speed record of 22 m.p.h! From the top of a large sand dune, the desert really looked like a desert, as in "Lawrence of Arabia". Somewhere beyond the sand was Tarfaya the last town in Morocco.

We set off again in a jubilant mood, navigating by compass in and out of the dunes. We followed any track which led in the right direction. But soft sand is mysterious stuff, and is always on the move. There was just one set of tyre marks that we were following and these looked pretty old. Suddenly as we rounded one sand dune, the last pair of tracks disappeared under a very large dune. Then it struck us all like a thunderbolt.—we were lost!

(To be continued)

"TANKS" continued from page 496

Has Russia no light tank? Yes, one, the "Plava juschtschiz Tank"—which means amphibious tank. It is large, with a boat-like hull, and carries a 76.2 mm gun. Its armour is very thin, and it is propelled in water by water jets. It has been used in Vietnam, in swamp conditions, but proved very vulnerable. They have not developed a parachute tank, although the Red Army was the first one to seriously study this type, back in 1933.

What of the use of tanks in action, 1945-70? They were used in the Korean war, at first by the North Koreans in mobile operations, and when these were checkmated, they were used by both sides as a sort of

mobile artillery. The Centurion won a great reputation for the quality of its protection, the hitting power of its stabilised gun, and its general reliability. The Russians used tanks in large numbers to crush the Hungarians and Czechoslovakians; they showed that their MBT was as useful for 'police' work as it was expected to be useful for battle. In 1965, the Indians fought the Pakistanis, both sides using tank formations. In furious duelling the rival tank fleets, made up mostly of Pattons and Centurions, with Shermans and I think some Russian tanks, cancelled each other out. The sandy country was littered with smoking wrecks—but once again the Centurion proved to be a life preserver as well as a hard hitter. This was verified again and again in 1967, when the Israelis taught the Egyptians a thing or two about mobile armoured warfare. By this time the Centurion was 24 years old as a design—but it did all that was asked of it, while carrying out night journeys and long-range endurance marches that its British operators had never dreamed of demanding from it! The Israelis hoped to re-equip their armoured forces with newer British Equipment, and there could be no higher tribute than that.



U.S. Tanks before the concept of "local nuclear war" demanded more sophisticated armour. The two tanks on the left and centre rear are equivalent to the Centurion. The tank in the foreground is equivalent to the Conqueror, and the tank at the right rear is so-called "light", but is roughly equivalent to the Soviet T34 of 1939.

So we might say that of all the MBTs descended from the old T34 type, the Centurion was the best—and if the Chieftain carries the same basic quality plus its new features, it too is a winner in its class.

But what of the future? Will the T34 type last forever? That indeed is unlikely. Already the Swedes are developing the "S Tank"—which features an armament as powerful as the modern MBTs, in a mount much easier to conceal. The tank has no turret, but an improved steering, and a suspension that can be raised or lowered instantly, so that it is almost as quick to aim with the whole 'S' tank, as with the turret of an ordinary MBT. Another idea, suggested by Colonel Peter Hordern of the R.A.C. Tank Museum, is to mount a self-loading gun in a miniature remote-controlled turret, which would give valuable improvement over the basic 'S' type.

As with the Seven Types of the inter-war years, the shape of a tank comes, basically, from the work expected of it. The duty of the MBT is no longer just to "facilitate the advance of infantry", or to "pursue a cavalry role". It is, "to be able to engage and destroy all battlefield targets"—and this may soon include the capacity to throw 'local' nuclear shells. Today's



The very successful Bristol Centurion 9, designed in 1944/45. Modelled originally on the Russian "T34 concept" of a fairly fast general purpose tank having sloped armour and a big gun.

M.B.T.s, awarded this fantastic range of duties, still bear the shape of a bygone class of vehicle, and some authorities think that this shape is due for a change.



Above: The M60, the U.S. equivalent to the "nuclear age" Chieftain. Note the night navigation and range-finding equipment.

Below: This tank has aluminium armour and can be dropped by parachute. One of the early production models of the Sheridan Weapon System, M551, note the short barrelled main armament, the old-fashioned under-cut shape of the turret and the night driving equipment.