Gulf crisis

Intense bombing not always decisive in past battles

News Analysis

LONDON, January 28 : Allied commanders in the Gulf boast that their bombardment of Iraqi targets is the heaviest in history , some past engagements that started similarly, however, have ended miserably for the bombers, reports AP.

" If you have a high- quality opponent, bombardment alone will not prevail." Peter Simkins, historian at the Imperial War Museum, said Thursday.

The allied forces are fighting in different terrain than in the two world wars, and with vastly different weapons against an Iraqi army of still unknown capability to withstand aerial punishment. But Simkins cautioned that they should still heed the lessons learned by their predecessors.

In the Second World War, in Monte Cassino and I suggest in Iwo Jima, Okinawa and Normandy, we enjoyed naval and air superiority. Yet despite enjoying these factors, we did not have an easy time, he said.

Bitter lesson

His colleague, Laurie Milner, said British forces learned a similarly bitter lesson in the disastrous first battle of the Somme, in France, in World War I.

"The British infantry was under the impression that there weren't any (German) men alive in the trenches, or if they were, they would be happy to surrender," Milner said.

At the Somme in 1916, the British deployed 1,537 guns, one every 20 yards (meters) . It was said to the greatest concentration of firepower up to that time, and it barraged the Garman trenches for a week .

When the Britain infantry attacked on July 1, marching slowly in compact formations, it was torn apart by machine guns.

The British suffered 21,392 dead --the worst day in British Army history.

Milner noted that the British commanders at the Somme didn't have the detailed aerial surveillance available today. Nor have the allies exuded the bullheaded optimism displayed at the Somme by the British commander, Field Marshal Sir Douglas Haig.

"In the early discussions, Haig had said that corps were not to attack until their commanders were satisfied that the enemy's defenses had been sufficiently destroyed; but this condition seems to have been dropped as time passed," according to the official History of the War.

1944 assault

In the 1944 assault on Monte Cassino in Italy, allied forces encountered furious opposition from German forces which survived bombardment that had reduced the hilltop monastery to rubble.

The allies set up the invasion of Iwo Jima by a then-unprecedented bombardment or the Pacific-6,800 tons (6.2 million kilometers) of bombs, followed by 22,000 shells in a three-day naval pounding before the invasion on Feb. 19, 1945 .

U.S. forces took 27,499 casualties before the fighting ended in June, against a Japanese garrison estimated to have no more than 23,000 men.

In Normandy, though the Germans " resisted us in their usual June professional way their resistance may have been a lot worse" without the pre-invasion bombing , Simkins said.

During the first week of the Gulf war, the multinational forces flew an estimated 8,000 bombing missions in what U.S. military officials described as virtually a non-stop assault. No figures have been given for the amount of bombs dropped.

Gen. H. Norman Schwarzkopf, leader of the U.S forces in the Gulf region, told reporters in Riyadh that U.S. warplanes on Saturday blew up five miles (eight kilometers) of pipelines that feed oil from storage tanks to the terminal.

He said intelligence reports showed that the flow of oil into the Gulf slowed after the U.S. attack.

Most efforts centered on protecting the critical desalination plants which provide two-thirds of the Gulf's 18 million people with drinking water.

Turtles, dolphins, whales, sea cows, fish and birds will probably be slaughtered by the spill, experts said .

Saddam prefers land battle: US congressman

NICOSIA, Cyprus, Jan 28 : The allies may control the skies, but Saddam Hussein wants to bring the Gulf war back to earth where he believes he can inflict serious damage on the multinational army,reports AP.

"Saddam still thinks he can survive the air campaign and then endure through a land war", said U.S. Congressman Les Aspin, Chairman of the House Armed Services Committee. "We have to show him that is not the case."

The Iraqi President's 544,000 troops in occupied Kuwait and southern Iraq had more than five months to dig in before the allied air campaign began Jan. 17.

Opposing them are more than 700,000 allied troops.

In addition to the formidable defenses Saddam's engineers have built in Kuwait, he also has another 500,000 troops scattered through Iraq.

Despite daily carpet-bombing by U.S. B-52 Stratofortresses and other aircraft, allied commanders have cautioned that the Iraqi ground forces cannot be eliminated by air power alone.

Saddam's "ground forces are now being hit heavily... though to date this does not seem to trouble him. He seems impervious to suffering," the chief of Britain's Defense Staff, Air Chief Marshal Sir David Craig, noted Friday.

Allied officials believe that Iraqi has built an extensive network of reinforces underground bunkers for many of their troops, particularly the Republican Guards, and tanks in area of Kuwait.

The Guards are Saddam's elite troops, veterans of the 1980-88 Iran-Iraq war, and are expected to spearhead any counter-attack if the allies breach the Kuwait defenses.

Soviet expert says

Task of liberating Kuwait difficult

MOSCOW, Jan 28 : " I think that we should not expect a quick end to the Gulf war , Lt. Col. Vladimir Pozdnyakov, an expert who had worked in Gulf countries for several years, told Novosti, reports IAN.

So far the forecasts of a lightning war have not materialised. The aviation of the Allied Forces will hardly quickly fulfil the task of liberating Kuwait. Despite the difference of capabilities, the US can be drawn into a protracted war.

Long-term forecasts should take into account the Arab factor, the morale of Iraqi forces and their training and education. The reaction of Arab countries to the hostilities in the Gulf and the possibility of their involvement in the conflict largely depend on the entrance of Israel into the war against Iraq, he asserted.

"Now about the combat readiness for Iraqi servicemen on the whole, they are disciplined and efficient," he said. On the other hand, they are doing their duty automatically rather than conscientiously. The general low educational level and lack of initiative, which are affecting their morale and disorganising their actions, are their drawbacks.

The 1967 war has examples of selfless heroism of Arab soldiers. However, they lost their bearings in a complicated situation and were sometimes affected by defeatist moods. Indeed, the Iraqi Army has eight years of experience of the war against Iran in local deserts. But that war was more positional than the current one, and was led by the Iraqi aviation, he added.

The current Gulf war will be more mobile, with possible tank breakthroughs and landings of marines . The Iraqi Army will have to manoeuvre more ,and its operation will be hindered by the actions of the US aviation, which will complicate the transfer of troops and the delivery of fuel and munitions.

An Eye-witness Account

Lakhs of bunkers built in Iraq

From AFP Correspondent

BANGKOK, Jan 28 : A That worker who built underground bunkers in Iraq was quoted by a Bangkok newspaper Sunday as saying he doubted the allied air offensive would succeed.

The Thai-language Daily Matichon quoted an anonymous "young Thai worker" as saying he worked on three types of bunkers designed to keep Iraq's Military Command, Air Force and arsenal intact under heavy bombing.

The three types included an underground aircraft hanger lined with iron, he was quoted as saying.

The hangars were usually surrounded by hills but had enough flat surface area for immediate take-off. After construction they were buried in sand and rubble and ringed by trees for camouflage, he said.

"When the Americans said they would bomb Iraqi airfields until the airplanes could no longer take off, they were mistaken", Matichon quoted him as saying.

The worker said he was employed by a German construction firm that had built thousands of bunkers in Iraq.

He estimated that there were tens of thousands of bunkers built by foreign companies contracted by Baghdad.

"I don't think America can beat Iraq, because of the bunkers that the allies were hired to build", he said, adding "the modern construction equipment that we used was American."

Thai workers, who were preferred for bunker construction project, were also employed to build underground concrete bunkers intended to serve as battle command posts and barracks for high-level Army officers, he said.

During construction the temperature inside the bunkers was kept between 28-34 degrees centigrade (82 to 93 degrees Fahrenheit), he said, adding that they were equipped with a range of telecommunications gear.

Thai workers also dug into mountainsides to build bunkers to store heavy weapons including anti-aircraft guns and tanks, he said.

Exposed areas were camouflaged with rubble left over from the digging to make the mountainside bunkers almost invisible from outside, he said.

Explaining why Thai workers were preferred for such projects, he said : "Thais don't only use their strength -- they also use their brains."

25 Scuds fired into Israel so far

JERUSALEM , Jan 28 : Israel said it wanted to help wipe out Iraqi missiles which have killed four Israelis and wounded 195, but showed no sign of changing its policy of restraint 11 days into the Gulf war, reports Reuter.

Iraq has fired 25 Scud missiles into Israel since the war erupted, and Defence Minister Moshe Arens said on Sunday the government was disappointed the threat persisted.

The government's position is that we would like to put an end to that missile threat, we understand the US air force is working very actively to do that. But so far success is less than complete, Arens said from Jerusalem in a US television interview.

We think we could make a contribution to neutralising that threat, Arens, said. To make that contribution of course we'd have to arrive at a level of understanding and coordination with the United States and particularly the US air force operating in that area

Israel has repeatedly said it will decide alone how and when to react to Iraqi assaults on its civilian population.

Feature

BARRIERS TO SUCCESSFUL NUCLEAR FUSION

As in the past, there are still technical problems of the most difficult nature to be solved before the unfolding of an artificial 'solar fire' as a source of energy.

When nuclear fusion research is spoken of today, it is the large projects which attract attention. However, experiments such as Asdex and Wendelstein in the Max Planck Institute for Plasma physics in Garching or the European Community (EC) project JET in Culham, Great Britain are only trigonometric points in a rich research landscape, in which solutions to the most difficult problems are being sought. In this area, the Nuclear Research Center in Karlsruhe is playing an important role, because here, about a third of the fusion technology programme of the EC is being carried out.

Nearly all national and international fusion programmes have as their goal the construction of a so-called tokamak reactor. The main components of a tokamak are a tyre-like container, the torus, and a system of magnets which surround this torus. Inside the torus, an electrically charged plasma, consisting of a reactive mixture of the hydrogen isotopes deuterium and tritium, is produced; the temperature of such a plasma is around 100 million degrees Celsius. The most important function of the magnet system is to prevent plasma particles, which are extremely destructive at these temperatures, from touching the torus wall. This is achieved by superpositioning two magnetic fields which are produced using different coil systems.

Recently, with JET, a plasma condition close to the desired ignition range was achieved. This result has given wings to the attempts to construct a successor reactor which is capable of ignition. In fact, two very similar reactors are being considered: NET (Next European Torus) is a project sponsored by the EC, whereas, the whole international community is involved in the development of ITER (International Thermonuclear Experimental Reactor). Which of these reactors will be built has not been decided.

Nearly all the components must standards which go way beyond the current state of technology. The magnitude of the problems is illustrated by the fact that while many critics of the fusion programme believe in the possible production of a plasma capable of ignition, they harbor serious doubts about overcoming these technical problems.

Most of the problems are caused by the fusion process.

Each time a deuterium nucleus fuses with a tritium nucleus to form a helium nucleus, a neutron possessing the energy released in the fusion process is produced. The neutrons, which, because they are uncharged, cannot be affected by magnetic fields, collide with the container walls at high velocities. Especially the first wall, which contains various components for heating and purifying the plasma, must be constructed from materials which do not become embrittled as a result of the neutron bombardment. To find materials which do not fatigue too quickly under such stress, extensive tests under simulated operating conditions are being carried out in Karlsruhe. Here, special steels and ceramics, i.e. silicon carbides are being used. The experience gained from working with current experiment reactors is of little use, since their operating conditions are different form those of a future NET or ITER.

Once the neutrons have penetrated the first wall, they must be captured by the blanket situated behind it. Here, the neutron energy is absorbed and converted to a state in which it can be used-- i. e. via intermediate stages, to steam. In addition, the neutrons must breed one of the fuel components.

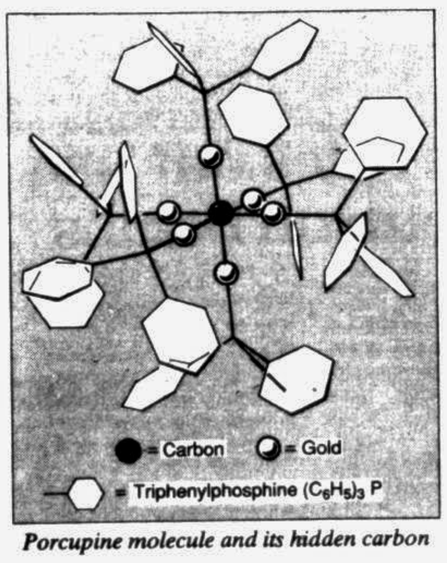
Deuterium can be produced externally from water and fed into the torus. However, the second component, tritium, is produced by splitting the light metal lithium in the reactor blanket itself. How this is best accomplished is the object of extensive research in various European laboratories. It is also necessary to integrate beryllium layers, in which a fast neutron is converted to two slow ones, into the blanket to ensure that enough tritium is bred.

In view of this, two concepts are being followed at the Nuclear Research Center in Karlsruhe. The first is based on an alloy of lead and lithium, which is liquid under operating conditions, and which is pumped through a tightly meshed channel system. In the second, fine small spheres of lithium ceramic serve as fertile material, while the cooling is taken over by a helium circulation system. The blankets have very complex formations, and that on a large scale. NET will have an external diameter of approximately 20 meters and a height of around 20 meters. This means that its blanket inside the torus can have a height of several meters and a total length of more than 30 meters. At present, around 20 percent of all research and development work of the Center in Karlsruhe is dedicated to fusion technology. This corresponds to financing of the order of several hundred million DM per year. In the whole of Europe around a thousand million DM is invested in fusion research each year.

— Dietrich Zimmermann(GRS).

Gold atoms trap carbon in a gilded cage

A GROUP of West German chemists has discovered a compound in which six gold atoms trap a lone carbon atom. The gold atoms force the carbon to bond in a way which seems to violate the basic laws of chemical bonding. Hubert Schmidbaur and his colleagues at the Technical University of Munich report their new compound, hexakis (triphenylphosphineaurio) methane bis (methoxytrifluoro) borate in *Angewandte Chemie*.



Porcupine molecule and its hidden carbon

The compound bristles with 18 benzene rings on the outside and for this reason Schmidbaur calls it the "porcupine molecule". When the researchers first investigated it, they got puzzling results. Using a mass spectrometer, which deflects ionised particles according to their mass, they found that the compound had one carbon atom too many. However, when they used nuclear magnetic resonance spectroscopy, in which a tuned magnetic field picks out a carbon atom by the spin of its nucleus, the extra carbon atom had vanished.

They solved the puzzle with X-ray analysis. This showed clearly that the extra carbon atom was hiding at the centre of a cluster of six gold atoms. Confined in its gilded cage, the carbon atom exceeds its normal limit of four covalent bonds.

The new compound confirms a theory by Mike Mingos of the University of Oxford in 1976. He suggested that a cluster of six gold atoms might acquire four extra electrons from a carbon atom and make a cage. □

Science and Technology

Search for the Pulsar On

Even today the 'smoke clouds' around supernova 1987A, seen in the earth's Southern Hemisphere have not yet cleared to the extent that the neutron star supposedly created by the explosion could definitively be demonstrated.

Less than three years after the explosion of the supernova 1987A in the Large Magellanic cloud in the Southern Hemispher, it appears that astronomers of the European Southern Observatory ESO in Chile have made an exciting discovery. They have found evidence for the existence of a neutron star.

The "classical" theory of star development assumes that, in the interior of stars rich in mass -- the star which exploded as supernova 1987A probably contained about twelve times as much mass as the sun -- the nuclear conversion processes which provide energy take place up to the formation of iron nuclei. The energy released in this manner is normally used to heat up the star; a process necessary to maintain its inner stability.

Without this "pressure" from the interior, the star would colapse under its own gravitation. However, during the last phase of a star's life, an ever increasing amount of energy is dissipated almost without effect in the form of neutrinos. These ghostly particles leave the star interior unhindered and can cause the giant gas ball to lose its equilibrium: the iron core collapses in unrestrained fashion and the exterior of the star follows suit like a house of cards.

This devastating collapse destroys the material forming processes taking place in the sar core; where previously nuclei and electrons could coexist, the electrons are, now so to speak, pressed into the nuclei, whereby the protons change into neutrons by emitting additional neutrinos. These nuclei can be so densely packed together that a cubic centimeter of such "degenerated" material would weigh several hundred million tonnes on earth -- approx. as much as a million locomotives. Such a compact ball of neutrons has an exceptionally hard surface, on which the collapsing gas material of the original star is sharply braked and extremely heated up. In such a situation the star material accumulates to such an extent that even the neutrinos, temporarily, find it difficult to escape from the collapsing core and lose part of their energy. This evergy component is, however, enough to force the gas material outwards and so start the explosion of the outer star remains; the supernova phenomenon runs its course.

The identification of the Crab Nebula in the constellation Taurus with a star explosion at the same place, recorded by Chinese Astronomers in July 1054 played a singificant roll in the development of this model. Walter Baade, a native of Germany had already pointed to a possible connection between the two phenomena in the mid forties, and shortly following the discovery of the pulsars at the end of the sixties by British Radioastronomers, just such an object was also located in the crab Nebula. It rotates around its own axis 30 times per second and thereby propagates pulses of radiation from a point on its surface, like a rotating navigation light. However, this crab Nebula pulsar is now too old to draw conclusions about its original conditions.

While up to now, scientists could not be certain if a neutron star really was left behind at the position of supernova 1987 A, the ESO astronomers on the Chilean mountain La Silla appear to have found clear evidence of the existence of just such an object. Using a 3.60 meter telescope, they were able to observe that the infrared radiation from the expanding material cloud had not further decreased in intensity; the temperature of the material flying away had, menwhile, settled at approx. minus 110 degrees Celsius. Obviously, the energy emitted from the radioactive nuchlear disintegration in the supernova phase, which has continually decreased in intensity, has meanwhile fallen below the intensity of that of the neutorn star created at the same time which has remained constant. Nonetheless, it remains unclear how long the center of the star explosion will remain obscured and if the neutron star will then be revealed as a pulsar.

-- Hermann Michael Hahn

How to Find 10 Atoms in a 100 -ton Solution

Researchers at the Institute for Thermal Chemistry at the Nuclear Research Center Karlsruh have explained how to find ten atoms of Germanium 71 among the 10^{30} (one followed by 30 zeros) molecules in an acidic gallium solution weighing around 100 tonnes using chemical process engineering.

Their method, which makes the search for the needle in the hay stack seem easy, plays a major role in a large-scale experiment, which includes not only an understanding of solar physics but also the nature of the particle family of neutrinos, which are released from the sun's interior. The project in question, which is under the leadership of the Max Planck Institute for Nuclear Physics in Heidelberg, is the international Gallex-Experiment, whose facilities are located 1400 meters deep in a tunnel under the Grand Sasso-Massif in Italy's Abruzzia. Its purpose is to make a new count of solar neutrinos, as upto now the number registered does not coincide with the number predicted by theories on nuclear fusion processes taking place in the sun.

Although these neutrinos are released in sheer immeasurable quantities, they have such a "weak interaction", according to the physicist's jargon, that they can practically pass through the planet earth without reaction as if it did not exist.

Now , in the depths of the mountain mass, where interference from less penetrating cosmic radiation is almost excluded, researchers want to capture at least some neutrinos from this powerful neutrino flow. The gallium solution weighing 100 tonnes and prepared from 30 tonnes of gallium serves as the medium in which these ten atoms of germanium 71 should be produced by the neutrino interaction.-GRS.