

Newspaper Analysis and Summary – 12th February 2015**NATIONAL****India-U.S. deal short on clarity: Russia** – *The Hindu*

Calling the India-U.S. nuclear agreement a “breakthrough” is premature, says Russia’s Ambassador to India Alexander Kadakin, who has called the announcements made during U.S. President Barack Obama’s visit “only promises with a dose of euphoria.”

In an exclusive interview to *The Hindu*, Mr. Kadakin rejected the idea that Russia felt the competition from the U.S. following the agreement, but said: “Russia today remains the only partner of India which is actually contributing to its peaceful nuclear programme.”

“It is too early to speak about ‘breakthroughs’ because of a lack of complete clarity, as not a single nail has been driven in any [American nuclear reactor] construction sites,” he said. “These are so far only commitments and promises, plus a dose of euphoria, which is not the best vehicle either in diplomacy or realpolitik.”

Mr. Kadakin’s responses, given in writing, to questions from *The Hindu* are significant as they indicate an unease in Moscow over closer ties between India and the U.S., especially in the nuclear sphere. In December, Russian President Vladimir Putin announced that 12 new reactors will be built by Russia in India, in addition to the operational and under-construction “Kudankulam-series” reactors (KKNPP 1&2 and 3&4) in Tamil Nadu.

Last week, Russian officials released a statement alleging that the cost of power from the proposed U.S. reactors would be double that from Russian projects in India. “Our Indian friends are fully satisfied with Russian-designed reactors, which are said to be the best in quality, safety, eco-preservation and, what is more, cost of energy,” Mr. Kadakin said.

Mr. Kadakin slammed U.S. President Barack Obama for his criticism of Russia made during a media interaction along with Prime Minister Narendra Modi in Delhi on January 25, which the Ambassador said “violated the basics and age-old traditions of international diplomacy.”

To a question on Ukraine, Mr. Obama described Russia as a “bully” and vowed to “ratchet up the pressure” on Russia. He described Mr. Putin as being “hell-bent on military conflicts.”

Asked about the potential embarrassment to India over those comments being made on Indian soil, the then Foreign Secretary Sujatha Singh had said: “India’s strategic partnership with Russia remains.”

Unique tool to track atrocities against Dalits – *The Hindu*

To monitor atrocities perpetrated against Dalits and Adivasis and to ensure speedy justice, a unique web-based tool — Atrocity Tracking and Monitoring (ATM) System — has been launched. The initiative falls under the aegis of the National Coalition for Strengthening SC/ST PoA Act (NCSPOA) by the National Dalit Movement for Justice (NDMJ).

A two-day training workshop will also be organised in the city next month to promote the use of ATM System among the stakeholders concerned.

“The ATM System has been built with an objective to provide a tool in the hands of Dalits and Adivasis to report atrocities and avail of timely justice. We hope it will be useful for Dalit human rights activists and organisations, to create and maintain a repository of cases, track records, and facilitate information exchange for timely action,” said V.A. Ramesh Nathan, general secretary, NDMJ.

“At present, more than 100 atrocity cases have been reported from different parts of the country. The users of the States concerned have sent e-mail and SMS notifications to the officials in their region regarding the cases of atrocities against Dalits,” he added.

As per the National Crime Records Bureau (2001-12), the extent of atrocities committed against SCs & STs is enormous. Nearly 3,70,234 crimes have been committed against SCs & STs, 15,917 women have reportedly been raped, 7,900 murdered, 49,514 brutally attacked and severely injured, and 1,59,692 other forms of atrocities have been committed.

Under the ATM System, anyone with Internet access can go to the website where a helpline number 9898915455 is given. As soon as a person sends a message on this number, the website automatically identifies its circle and sends a message. After the validation is done, the message goes to the authority concerned to facilitate necessary action against the case.

The NDMJ, is a democratic non-party movement of Dalit survivors, defenders, academics, organisations headed by Dalits to initiate advocacy and involve in mass action to address the issues of caste-based discrimination and violence (primarily untouchability and atrocities) to ensure dignity, equality and justice.

INS Viraat to be decommissioned in 2016 – *The Hindu*

The Navy is learnt to have taken the call to retire the decrepit warhorse INS Viraat, the aircraft carrier that has had a service life of 56 years as on date — first as HMS Hermes in the Royal British Navy and in its present avatar since 1987.

Viraat — which saw action in the Falklands War and remained for well over a decade the sole aircraft carrier in the Indian Ocean region following the decommissioning of the first Indian carrier INS Vikrant in 1997 — is slated to have a grand farewell at the International Fleet Review at Visakhapatnam in February 2016.

It is in the process of obtaining Defence Ministry’s clearance to the retirement plan.

Mounting maintenance costs and rapid depletion of its integral fleet of Sea Harrier jump jets are said to have catalysed the decision to decommission Viraat. The Navy shelled out Rs. 70 crore for the last routine refit of the carrier.

The carrier was to have been dry-docked at the shipyard for the next round of periodic refit in December last year, but it was called off in view of the retirement proposal. Viraat is now expected to have its decommissioning refit sometime in the middle of 2015, say sources.

The retirement call was forced, in part, by the dwindling fleet of Sea Harrier fighters operating from the deck of Viraat. While the limited upgrade Sea Harrier (LUSH) programme bestowed the fighters with modern avionics and beyond visual range (BVR) strike capability, the ageing airframe has been a concern. Not more than seven Sea Harriers

are available at the moment — some of them cannibalised (used as ‘Christmas Tree’ for spares) to keep the relatively agile ones airworthy.

“Thanks to the Navy’s stringent maintenance regimen, we have been able to operate Viraat without major glitches until now. But the Harrier fleet has dwindled so much that within the Navy, Viraat is often referred to as a ‘One Harrier carrier’. No point flogging it any further,” an official said.

India’s first carrier Vikrant, which was turned into a maritime museum post-retirement in 1997, has now been broken up after its upkeep became ostensibly unviable.

Pause on decisions on urea, LPG cylinders and kerosene – *The Hindu*

The Modi government is putting on hold its plans for some key economic reforms Union Finance Minister Arun Jaitley had announced in his maiden Budget last July.

These include decontrol of urea prices, fewer subsidised cylinders a year and withdrawal of kerosene from the public distribution system (PDS).

Fertilizer Minister Ananth Kumar told *The Hindu* that the administered price controls for urea would stay. “We are committed to keeping the policy pro-farmer,” he said.

Fear of a political backlash based on inputs from party leaders — now established by the rout in the Delhi Assembly elections — has forced the hands of the government.

Asked if the government’s unpopular reform proposals were behind the victory of the Aam Aadmi Party in Delhi, Mr. Kumar said: “Narendrabhai Modi was and always will be pro-farmers.”

“The Finance Minister has already put on hold an order dated November 24 that directed us to withdraw kerosene as a general PDS item and direct it only to un-electrified households,” said an Oil Ministry official. “PDS kerosene will continue for now.”

The fine print of the July Budget said: “... there is need to cap the [number of] subsidised cylinders at a more realistic level.” The Oil Ministry source said that after the AAP victory in Delhi, the Modi government was likely to keep the number of subsidised cylinders at the existing 12 a connection annually. “The Oil Minister is not in favour of reducing the number.” When contacted, Oil Minister Dharmendra Pradhan’s office said he was not available for comment as he was out of the country.

Protecting and even expanding the PDS and keeping fertilizer prices low were part of the election promises that the Aam Aadmi Party (AAP) made in Delhi.

The AAP manifesto says: “The AAP government will end corruption in the PDS with the involvement of mohalla sabhas ... instead of direct cash transfer, we will ensure direct transfer of rations to the families and will include dal and oil in the PDS.”

The AAP supports lower fertilizer prices as it believes high input costs in the face of low procurement prices are pushing the rural economy into distress and thousands of farmers to suicide every year.

The fine print of the July Budget said: “What is now urgently required are certain pricing reforms in the urea sector with an immediate price correction for urea ... This is not only essential from the viewpoint of the size of the subsidy bill but also from the viewpoint of balanced use of N, P & K [Nitrogen, Phosphate & Potassium] nutrients.”

Urea is the only fertilizer under statutory price control for which the maximum retail price is fixed by the Centre. The difference between production cost incurred by a manufacturer and the administered concessional price is reimbursed as subsidy. For the purpose of the calculation of the subsidy element, the Fertilizer Ministry, in consultation with manufacturers, determines the production cost for every urea plant separately. As a result, the manufacturers’ lobby is opposed to reform.

The other fertilizers were shifted to a subsidy regime by the Manmohan Singh government under which subsidy is no longer paid to manufacturers on the basis of production cost. Instead, the quantity sold is taken into account.

SC refuses to quash CAG appointment – *The Hindu*

Noting that “there is nothing against the man,” the Supreme Court on Wednesday dismissed a public interest litigation petition to quash the appointment of 1976 batch Bihar cadre IAS officer and former Defence Secretary Shashi Kant Sharma as Comptroller and Auditor General of India (CAG).

A three-judge Bench led by Chief Justice of India H.L. Dattu observed that the court should not react to every sound of alarm and “meddle” in constitutional appointments.

The PIL was filed on behalf of the former Chief Election Commissioner, N. Gopalaswami; former Chiefs of the Naval Staff Admiral (retd.) R.H. Tahiliani and Admiral (retd.) L. Ramdas; former Deputy CAG B.P. Mathur; and five other retired bureaucrats.

The petition, represented by advocate Prashant Bhushan, alleged that as DG (Acquisitions) or as the Defence Secretary, Mr. Sharma had cleared several major defence purchases, some of which had turned out to be a source of embarrassment to the Centre.

Appearing for the Centre, Attorney-General Mukul Rohatgi countered that under the Constitution, it was the Executive’s prerogative to recommend the name of the CAG to the President. Mr. Rohatgi said the court could not interfere in this constitutional process.

In response, the Bench pointed to Mr. Bhushan’s contention that the Supreme Court should intervene, as it did to free judicial appointments from Executive interference by setting up the Collegium system, to provide transparency in CAG appointments too.

At this, Mr. Rohatgi countered that the interpretation of the Constitution in the Second Judges case in 1992 creating the collegium system for appointment of judges was incorrect.

The Bench observed that there was no reason Mr. Sharma should “suffer disqualification.” It declined to pass any order on the submission that guidelines be laid down for the selection process.

Pradhan seeks expediting of TAPI project at Islamabad meet – *The Hindu*

Petroleum Minister Dharmendra Pradhan, who on Wednesday became the first Minister of the Narendra Modi government to visit Pakistan, has called for early finalisation of the consortium leader for expeditious implementation of the 1,800-km Turkmenistan-Afghanistan-Pakistan-India (TAPI) natural gas pipeline project in limbo for almost a decade.

Officials of the External Affairs Ministry said Mr. Pradhan's visit was in his capacity as Minister to the "multilateral" meeting, even so the visit and his one-on-one meeting with Prime Minister Nawaz Sharif is the first of its kind since India cancelled the Foreign Secretary talks in July 2014.

Mr. Pradhan, who was in Islamabad to attend the 20th steering committee meeting of the TAPI project, also called on Mr. Sharif along with the TAPI Petroleum Ministers.

"The very fact that India has had regular ministerial representation at the TAPI steering committee meeting bears testimony to the importance attached by the government to this project despite the apprehensions about the geo-political situation and security scenario involving the project," an official statement said.

Mr. Pradhan said a mutually acceptable consortium leader was a vital step towards implementing the project in a time-bound manner.

He reiterated India's commitment to source natural gas from Turkmenistan through the pipeline. Turkmenistan has the world's fourth largest proven gas reserves.

The pipeline will allow the landlocked country to export up to 33 billion cubic metres of natural gas a year from Turkmenistan to Afghanistan, Pakistan, and India over 30 years.

He said the TAPI project would contribute to building a national gas grid as envisioned by Prime Minister Narendra Modi.

The state gas companies of Turkmenistan, Afghanistan, Pakistan and India have established a company that will build, own and operate the pipeline.

The countries have to select a commercial consortium leader to spearhead its construction and operation. The commercial consortium leader will take a substantial stake in the company. Mr. Pradhan met his Afghanistan counterpart on the sidelines of the steering committee meeting.

Popping open the secrets of a fun food – *The Hindu*

To most people, it may be just a fun food to munch while watching a movie. But to a couple of French investigators, popcorn was a biomechanical enigma waiting to be explained.

In an unusual study published on Wednesday, engineers Emmanuel Viot and Alexandre Ponomarenko carried out experiments into what makes popcorn, well, pop.

Cameras recording at 2,900 frames a second helped show what happened when a kernel of corn strutted its stuff.

When the temperature reached 100 degrees Celsius, some of the moisture inside the corn started to turn into steam, the researchers found. As the temperature rose to around 180 degrees, pressure built to around 10 bar, or 10 times the atmospheric pressure at sea level.

Unable to withstand the stress, the outer shell broke open, causing a dramatic drop in pressure that forced the kernel's starchy innards to expand and protrude.

“We found that the critical temperature is about 180 degrees, regardless of the size or shape of the grain,” said Mr. Viro, an aeronautical engineer at the elite Ecole Polytechnique.

The first thing to emerge from the fractured shell is a limb-shaped structure — a “leg” — that comes into contact with the surface of the pan and starts to compress under the heat.

Tensed and then released, the “leg” causes the corn to leap up to a height ranging from a few millimetres to centimetres and emit a “pop” from the sudden release of water vapour. A few milliseconds later, the granules spewing from inside expand to form a spongy flake.

Evolution from fracture to flake takes less than 90 milliseconds (0.09 of a second).

The popcorn's leap results from an intriguing combination of thermodynamics and fracture mechanics, rather than just the blast of pent-up gases.

“A piece of popcorn has a singular way of jumping, midway between explosive plants such as impatiens and muscle-based animals such as human beings,” the researchers said.

The study appears in the Journal of the Royal Society Interface . — AFP

INTERNATIONAL

300 feared drowned in the Mediterranean - *The Hindu*

More than 300 migrants were feared drowned on Wednesday after their overcrowded dinghies sank in the Mediterranean, the latest boat disaster on the perilous crossing from Africa to Europe.

The victims were among migrants mainly from sub-Saharan Africa who had left the coast of Libya at the weekend in four small boats, the U.N. refugee agency said.

“This is a tragedy on an enormous scale and a stark reminder that more lives could be lost if those seeking safety are left at the mercy of the sea,” UNHCR Europe director Vincent Cochetel said in a statement.

Details of the new disaster emerged after nine survivors out of a group of more than 200 packed into two dinghies were rescued by the coastguard and taken to the Italian island of Lampedusa — just days after 29 perished in the same area.

“Nine were saved after four days at sea. The other 203 were swallowed by the waves,” UNHCR spokeswoman in Italy, Carlotta Sami, said on Twitter.

The agency later said that reports gathered by UNHCR from the Italian coastguard and the survivors in Lampedusa now suggest some 300 people are confirmed missing.

In the last year alone, several thousand people have died trying to cross from North Africa to Europe across the Mediterranean, on what the United Nations has described as the most dangerous route in the world.

The IOM said the surviving migrants from the latest disaster spoke French, so probably came from West Africa.

“Because of the bad weather conditions, the two dinghies collapsed and the people fell at sea. Many drowned,” said the IOM spokesman in Italy, Flavio Di Giacomo.

The organisation’s spokesman in Geneva Joel Millman told AFP that information was coming in about another stricken boat and warned that the overall toll may reach as many as 350.

The latest deaths have highlighted the limited means and scope of Triton, an EU-run mission which took over in November from the Italian navy’s Mare Nostrum search and rescue operation.

— AFP

SCI-TECH AND AGRI

Simple technologies offer effective solutions - *The Hindu*

Compared to grains like paddy or wheat, vegetables are considered quick money for a farmer. It takes 3-4 months for the vegetable crops to start yielding and generate income compared to paddy, wheat or fruit trees.

Having a shorter life span, the crops are more prone to insect pests and disease attack mainly due to their tender and soft skin.

Be it traditional varieties or hybrids the fact remains that the crop gets infested with pests and till date complete control over the pests has been a challenging task.

New problems

“Especially farmers’ dependence on pesticides and their indiscriminate use have made the pests resistant and also contaminate the vegetables since the soft skin absorbs the toxic within it. Introduction of high yielding varieties and hybrids, no doubt, increased production manifold but also resulted in changes in pest scenario and many new pest problems have emerged,” says Dr. T.N. Devaraja, Programme coordinator, Taralabalu KVK, Davanagere, Karnataka.

A survey carried out in the country indicates that 50-70 per cent of vegetables are contaminated with insecticide residues, according to him.

It becomes the responsibility of the scientists and agricultural experts to create awareness among farmers about the right dosage of inputs to be used and if need be suggest alternatives to chemicals while taking care to see the yield does not dwindle. Siddanur

village in Davanagere district is a major tomato growing region and apart from tomatoes, maize, cotton, arecanut, banana, pomegranate and other vegetables are also cultivated.

Indiscriminate sprays

Farmers have been spraying huge amounts of pesticides for management of pest and diseases in these crops especially tomatoes.

But far from being solved the problem persisted.

Some of the farmers contacted the Taralabalu KVK for a viable solution.

“The village is situated 17 kilometres away from the district head quarters and has 200 farm families. When the farmers met us we decided to set up a pilot demonstration unit on composite management strategies for the crop in a field of a volunteer farmer,” says Mr. T.N. Prasanna Kumara, plant protection specialist at the institute.

It is a multidisciplinary model and has a special role in increasing the production of food grain, because it manages insect-pests through minimum use of pesticides, which helps in achieving higher production.

Some of the technologies used in this method are nylon nets, planting marigold as trap crop, installation of bird perches, using 4-5 pheromone traps and application of bio inputs like trichoderma and neem cake.

Net income

The net return from these practices in the field for 4-5 months was Rs.1,69,000 from a hectare as compared to Rs.91,250 previously.

Farmers should take into account that this income has been generated in the field which had carried out all the specific instructions and was monitored by the expert team.

It was a pilot study to prove that adopting these types of practices can increase income from such crops, according to Mr. Prasanna.

“My personal opinion is that like grains, there should be a minimum support price for vegetables like onion, tomatoes and brinjals.

No proper pricing

“As of now there is no fixed slab on the market price for these vegetables and their sales has always been mercurial, sometimes farmers discarding the vegetables for lack of good price,” says Dr. Devaraja.

Farmers in the region were invited by the Kendra to see for themselves how this method has been helpful in increasing yield and income. The result is, today about 20 acres in the village have come under this technology.

Understanding the INO – The Hindu

The India-based Neutrino Observatory (INO) project has been facing a barrage of questions from environmentalists, politicians and others ever since the project was cleared. One of the

queries concerns the actual experiments planned and the nature of neutrinos themselves — whether the experiment will use artificially manufactured neutrino beams and on the safety to humans and the environment if such neutrinos are used.

The concern about the use of artificially manufactured neutrino beams is rooted in a 2004 paper by Naba Mondal, Project Director of INO. He had written that in order to receive neutrinos from neutrino factories all around the world at a later date that they are setting up the magnetic detector. Dr. Mondal clarified to this Correspondent that the statement was made in the preliminary stages of formulating the experiment, when it was not known what source of neutrinos would be needed.

The team had planned for this method for its second phase of operation in order to measure one of the parameters associated with “neutrino oscillations.”

However, China, using neutrinos from their Daya Bay nuclear reactor, has by now already measured this parameter, so the need and the plan for this phase of operation of the INO experiment no longer exist.

Even if such a beam were to be used, it would have had no harmful effects, he stressed. “A human being can stand in the path of such a neutrino beam for his or her lifetime, say eighty years, and only one neutrino will perhaps interact with the body,” he said, quantising his argument that even if such a beam were to be commissioned, it would have no side-effects.

To mention two experiments using neutrino beams, the Fermilab experiment has been beaming neutrinos to Minnesota (Soudan Mine) which is nearly 735 km away for about 15 years; beams from CERN in Geneva reach the Gran Sasso laboratory in Italy (over 700 km away), this has been running for about seven years. The U.S. is developing an experiment called the Long Baseline Neutrino Facility to beam neutrinos from Fermilab to Homestake mines (in the U.S.) in which scientists from various countries including India are participating.

“Sending a neutrino beam for experiments to a faraway detector is nothing new. If there were any danger with such beams, will the U.S, Japan and Italy have allowed this? In any case, INO will use only atmospheric neutrinos,” said Dr Mondal.

In this context, it is necessary to look at the nature of neutrinos. It is not correct to say that naturally occurring neutrinos have only low energies.

Neutrinos coming from the atmosphere, such as cosmic rays have very high energies, just as the extragalactic neutrinos detected at the IceCube experiment in the South Pole. So when we say we are being bombarded by neutrinos, it also includes neutrinos of high energies. In this sense, making the distinction between “natural” and “artificial” neutrinos is meaningless.

As a matter of fact, neutrinos may even play a role in maintaining peace. They can be used to monitor nuclear reactors to check if anyone is making away with stores of plutonium which can be used in making nuclear weapons. This is a part of ongoing research in France.

Mining brought pollution 240 years before industrial revolution – *The Hindu*

Frozen beneath layers of mountain ice in Peru, scientists have found toxic trace metals that point to sources of pollution 240 years before the industrial revolution.

Researchers who studied ice core records from the high-altitude Quelccaya ice cap (in Peru) found “archives” of preindustrial trace elements, which they have traced back to 16th century colonial silver-mining operations in Potosí (now Bolivia). Quelccaya is one of the few sites on Earth where pre-industrial pollution of air caused by human activity can be studied today.

Around 1540, the Spanish Empire forced Incas to work on extracting silver in Potosí's mountaintop mines, the main source of silver at the time. The pollution from the mining and smelting activities was carried by the wind 500 miles northwest into Peru where it settled on the Quelccaya ice cap, says a paper published in the Proceedings of the National Academy of Sciences .

Spanish Conquistadors, who were mainly interested in silver, saw a technological breakthrough in 1572 with a mercury amalgamation process, which triggered an unprecedented mining boom across the Andes. The Incas, who also knew how to refine silver, used a “huyara” or wind-drafted furnace made of clay.

Researchers used a mass spectrometer to identify chemicals — including arsenic, chromium and lead — present in the ice, starting from 800 AD. After the demise of the Inca Empire (A.D. 1532), the concentrations and trace elements increased, they found.

Unlike in the case of other continents, trace element deposition arising from human activity in the 20 Century started later in South America. However, the deposition was several times higher than during the Colonial period.

The deposition during the Colonial period, in turn, was several times higher than during the Inca Empire “when natural fluxes for the region dominated.”

Double-action drugs: one key opens two locks – *The Hindu*

In the history of medicine, the hunt for drugs has been an empirical one. Substances from plant, marine and even animal sources have been tried and, over the years, several useful substances have emerged as medications against chosen illnesses as well as for specific medical conditions. More often than not, many of these are general-purpose ones used as tonics, such as ginkgo biloba or green tea in the Orient, Ashwagandha in Indian Ayurveda, or Zinda Tilismat in the Unani system. But in some ones such as the cinchona bark against malaria, or leaves from the periwinkle plant, used in traditional medicines against cancer, the ‘active’ principles have been confirmed by modern organic chemistry to contain quinine, and vincristine respectively. Yet all these attempts have been empirical, trial and error methods that have taken centuries to grow.

With advances in chemistry, it has become possible to separate individual molecules from such mixtures and synthesise them in pure form in the laboratory — a branch that bears the name natural products chemistry, an area that has been a fertile and focused field in India since the 1950s.

At the same time, advances in the medical sciences, particularly in the field of pathology, have led us to focus on the organ, tissue and cells which are affected and malfunction. And advances in biology have allowed us to get an idea of what has gone wrong at the molecular or cellular level during the malfunction, thus leading to the era of cellular and molecular medicine.

For example, the disorder diabetes is caused by abnormally high levels of sugar in the body. While sugar is essential since it is the fuel for the maintenance and growth of cells and tissue, excess levels of it go to “choke” the metabolism by modifying the chemical structure (and therefore the function) of several proteins’ molecules. One example is the chemical reaction between sugar and the oxygen-transport protein, haemoglobin. This reaction modifies the structure of haemoglobin in a manner that its ability to carry and transport oxygen to cells is affected. Once this choking action had been understood, researchers have developed drug molecules (such as metformin) that level down the production of sugar in the liver to acceptable limits.

Note that the drug that the researcher ‘designs’ should fit the relevant molecules/cell component specifically like a glove on hand or a key on a lock. That way, the specific step(s) are affected without disturbing other components in the cellular machinery in any manner, so that there are no side effects.

It happens occasionally that the “side effects” may not only be harmless, but may prove helpful elsewhere in the body for some other malfunction, purely by happenstance. Aspirin is one such double-action drug. Introduced first as a pain-reliever, it has also been found to help dissolve clotting of blood. Its analgesic action is on the nervous system while its clot-dissolving action is through its action on platelet cells in blood. Aspirin is thus a master key that appears to open more than one lock. And it is not just a single example — there are others.

The molecule termed ELQ 300 is an antimalarial, which acts against the malaria parasite both in the liver stage and when the parasite has already entered the bloodstream as well, making it a double-action drug. Likewise the peptide M5 that Dr Anand Ranganathan has come out with (described in our last column of January 29, 2015,

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malaria-and-tb/article

6830912.ece), promises to be effective against TB and malaria.

A recent double-positive example comes from the University of Texas Health Science centre. Dr Shapiro and his group there have found that the drug retiganine, used to control convulsion in epilepsy patients, acts also as an effective drug to reduce acute stroke in mice. The group finds that mice affected by stroke, when treated with this anti-epilepsy drug, showed no difficulty in movement, balance and coordination.

Why did the group even try retigabine? “We thought if we could stop the neurons from firing, stopping their electrical activity, we could conserve their resources until the time their blood supply was restored. This proved to be the case”, Dr Shapiro is quoted as saying. . And his coworker Dr Bierbower says: “It is treating the first step in the sequence and stopping the more damaging secondary effects. These agents (like retigabine) directly affect the nerve cells themselves.”

With increasing knowledge gained about the detailed shape and architecture of proteins and other biopolymer molecules in the cell (the ‘locks’), and their computer-based modelling on one hand, and the electrophysiological steps on the other, the field of ‘in silico’ or computer-projection and representation of the cellular players has become possible. This allows us to look for drug molecules (the keys) that fit in like Lego pieces — the possibility of finding more than one “lock” increases and the number of double action drugs’ promises (even triple-action ones) will be on the rise. The ‘ vaidya ’ or medicine man has now become the computer-savvy drug designer.

The old trial and error is modernised into “high throughput screening” of hundreds of molecules, and the time for ‘bingo’ here is in days rather than years. But the principle is quite the same. As the French have it: Plus ça change, plus c'est la même chose , or “the more things change, the more they stay the same.”

EDITORIALS

A ‘breakthrough’ that is no big deal - *The Hindu*

In an unusual move this week, the government sought to clear the air over the India-U.S. nuclear “breakthrough understanding” announced by U.S. President Barack Obama and Prime Minister Narendra Modi, with a detailed press release on the subject. The move was prompted by several questions being asked over how the two leaders had been able to announce a breakthrough in issues that have held up nuclear trade for five years. The bottom line, the government said, was that the Civil Liability for Nuclear Damage (CLND) Act of 2010 remained untouched. However, it is the government’s reading of that law that is problematic, especially as it concerns an issue which touches the life of every Indian: as an energy consumer, a taxpayer, and a potential victim of any untoward nuclear accident.

The energy basket

Let’s be clear. The problem is not with the India-U.S. civil nuclear deal. After all, nuclear energy is something India has made a conscious move towards since 2000 in a bipartisan manner, with both the United Progressive Alliance and the National Democratic Alliance governments pushing ahead with it. By 2035, India’s projected energy demand is expected to grow by 132 per cent and India will surpass China as the world’s highest energy consumer according to the latest BP energy outlook report. Given India’s projected population growth, and the worldwide push for clean energy, it is clear that nuclear energy, with its low carbon content, and centralised land requirement, will form a key component of our energy mix. As a result, just last month, the government has tripled its target to 63,000 MW of nuclear energy by 2032, more than 14 times what is produced today.

The problem is also not about making special concessions to the United States. If it hadn’t been for the American administration led by President Bush, India would have had few options to build its nuclear energy programme, and access fuel and nuclear supplies from other countries. After the U.S. did the “heavy lifting” in getting India a legitimate place in

the international nuclear regime, it would seem churlish to suggest that India should cut out U.S. businesses like GE and Westinghouse from the market simply because they demand more favourable terms than Russian or French ones do.

While the prospect of better relations that the nuclear breakthrough will engender between New Delhi and Washington is indeed a worthy cause, its worth must be weighed against the cost. In essence, in order to assuage U.S. supplier concerns over Indian liability laws, the agreement will end up being billed to the consumer multiple times, and ensure that the supplier pays virtually nothing at all.

Liability and cost

To understand this conclusion, one must break up the “breakthrough understanding” Mr. Obama referred to, into two silos: liability and cost.

At every stage of the nuclear process, the government has negotiated to minimise the liability of the supplier (who could be U.S., foreign or Indian). To begin with, the Civil Liability for Nuclear Damage Act of 2010 itself capped all liability to 300 million Special Drawing Rights (SDRs) (\$420 million or Rs.2,610 crore). The figure was arrived at in 2010 after much debate, but it would have been far higher today, given two events that followed.

First, in March 2011, a tsunami off the coast of Japan led to a technical fault and a meltdown at the Fukushima nuclear reactor plant. To date, nobody knows just how many people were affected by the leak, as officials didn’t categorise the casualties by “cause of death or injury” as that would affect the immediate compensation they received. In 2014, various estimates put the damages and clean-up between \$100-\$250 billion. Second, in September 2011, the U.S. government’s joint investigation team on the BP “Deepwater Horizon” oil spill off the coast of Mexico found that not only was the “operator” BP liable for the damages, but also Halliburton, that carried out the construction of a faulty well, and Cameron, the company that designed and manufactured a “blowout preventor stack”, that had malfunctioned. The investigation team’s report in 2011 was path-breaking and got the supplier, Cameron, to pay a settlement of \$250 million. Given the experiences of the costs of a nuclear accident in today’s times, and how much liability every part of the process chain must bear internationally, Parliament and the Indian government may have revised the proposed cap to a much higher figure than the \$420 million it is and made the CLND Act more stringent than it did then. In the unthinkable event of a nuclear blowout, it will be near impossible to get close enough to the melted core of a reactor to ever know just who was responsible for it; so the fault of the supplier will also be much more difficult to prove than in the BP case.

More questions than answers

It is curious, then, that after the last round of negotiations, the Ministry of External Affairs (MEA) has put out an explanation that only seeks to reduce the liability that suppliers will face. The answers to frequently asked questions (FAQ) supplied by the Ministry of External Affairs (MEA) seem to be deliberately aimed at easing the concerns of the suppliers, and not the concerned Indian consumer. Under its explanation of section 17 (question 9), for example, it says the law “permits but doesn’t require an operator” to make the supplier liable in its contract for a nuclear reactor or part. It also says that a supplier can be sued for damages only “if it is expressly provided for in a contract in writing.” (question 8). What supplier would feel obligated under the circumstances to sign for liability in a contract,

when it isn't "mandatory" according to the government of the day? While the FAQ mentions that the state-run operator, Nuclear Power Corporation of India Ltd., "would" insist on such a clause, it doesn't answer this basic question.

Nor does it answer what would happen in case the nuclear industry is privatised and the operator is no longer a state-owned entity.

Next, the MEA release does away with the right of recourse of a victim to sue the supplier in India directly (question 7) as well as in a "class action suit" in foreign courts (question 13) where it says that section 46 on tort law "does not create the grounds for victims to move foreign courts." All of this is done under the cloak of conforming to the International Convention on Supplementary Compensation for Nuclear Damage (CSC 1997), but it doesn't explain why the government is going to such great lengths to exclude the supplier for a law that had been debated so hard in the Indian Parliament only so that it would include the supplier. The contrast between Arun Jaitley's article of September 2013, as Opposition leader, where he referred to the "hidden hand of nuclear vendors" and insisted on making liability for the vendor or supplier "mandatory" and just 15 months later, when as Union Finance Minister, he was a key part of the nuclear contact group meeting that hammered out this agreement, could not be more distinct.

Mounting costs

Finally, we come to the cost of the breakthrough to the Indian consumer/potential victim. As a sweetener for suppliers, the MEA has spelt out a "nuclear insurance pool" for the Rs.1,500 crore that is the minimum required (questions 14 & 15) to be set aside by law. Curiously, while one tier of the pool will cater to operators, tiers 2 and 3 are meant for the same suppliers who have largely been insulated from any liability. The pool will be made up by the government and state-owned insurers administered by the General Insurance Corporation of India. In the unfortunate event of any incident, this pool would be used to pay damages immediately to the victims, the government would be liable for an additional Rs.1,110 crore, and after which the International CSC fund would bear residual damages (applicable only once India ratifies the CSC). The supplier, it is made amply clear, will pay nothing but a nominal premium to the insurance pool, which no doubt will build into the cost of supplies.

To make it simple, the Indian consumer/taxpayer will pay for the following: the cost of land allotted to the nuclear reactor, the costs of building and operationalising the reactor, the cost of the insurance pool run by state-owned companies, the costs of half the pool that the Central government will provide, the cost of electricity per unit (expected to be at least double that of existing reactors), the immediate damages disbursed by the insurance fund in the terrible event of an accident, the subsequent damages paid for by the Central government, and not to mention the legal costs if the government or operator decides to sue the supplier!

Confusing the consumer

The real problem, then, is that nothing is "simply put" in the nuclear debate. Instead, clever, complicated and arcane language has been used to obviate the real meaning and obfuscate its consequences for the consumer. Such simplicity may also explain how the same set of Indian officials, negotiating with the same U.S. administration for more than five years over

the same law, were able to produce a new and unique consequence, now being called the “breakthrough” in the nuclear deal.

For cooperative federalism – *The Hindu*

The views expressed by Chief Ministers at the maiden meeting of NITI Aayog’s Governing Council last weekend, demanding greater freedom to frame their own development plans, vindicate the thought process that went into conceiving the body that has replaced the 60-year-old Planning Commission. Promoting cooperative federalism and giving States greater freedom in designing their development plans were two of the key objectives behind the setting up of the NITI Aayog. Chief Ministers, cutting across party lines, demanded that they be given such freedom, with Kerala Chief Minister Oommen Chandy pointing out that schemes such as Jan Dhan Yojana or Beti Bachao were of little relevance to his State which already boasted of superior metrics in both fields. Similarly, Rajasthan’s Chief Minister demanded that the number of Centrally-sponsored schemes be reduced to 10, while Haryana Chief Minister Manohar Lal Khattar wanted such schemes to be dispensed with altogether. If these demands prove something, it is this: there can be no one-size-fits-all approach to development in a diverse country like India. And no longer can development be orchestrated from the Centre alone; it is as much the preserve, prerogative and responsibility of the States. Thus, the NITI Aayog will stop with making recommendations; implementing them will be the responsibility of the States.

An important decision made at the meeting was to constitute a subgroup of Chief Ministers who would study the 66 Centrally-sponsored schemes to assess whether they should be continued, transferred to States or dropped altogether. While doing this assessment, care should be taken to ensure that socially important inclusion schemes are not either downgraded or dropped. There could be examples of schemes that may not have national relevance but have resonance with particular States; these should be identified with due care and alterations should be made only after a consensus is evolved in the Governing Council. In this regard, it is encouraging to note that inclusion of the vulnerable and marginalised sections and redressing identity-based inequalities are at the top of the seven guiding principles for the Aayog as laid out in an e-book published by the government. This should also reassure those who see the body’s mandate as promoting a free-market economy which could come at the cost of the less-developed States. Of course, the true test of this government’s commitment to inclusive policies will come in the Budget’s allocations to social sector schemes. All the lofty ideals of the Aayog will come to naught if the government, forced by fiscal considerations, decides to set aside lower sums for social spending.

The riddle of powering electric cars – *The Hindu*

Steve LeVine became interested in batteries in the wake of the U.S. financial crisis. LeVine is the Washington correspondent for Quartz, a news site covering the global economy, and he sensed, he told me recently, “a loss of confidence in the U.S., in our ability to create a real economy” — one based not on financial instruments or a real estate boom, but real products that would help create entire new industries.

The battery could be such a product. Not just any battery, of course, but a battery designed for electric cars and capable of powering them for 200 miles or even 300 miles per charge; a battery that could compete with and eventually replace the internal combustion engine and transform the electric car from a niche product to a mass-market automobile.

Such a battery did not yet exist. But if such a thing could be invented, it might well develop into a \$100 billion-plus market in its first five or six years of existence, according to LeVine. A battery like that could vastly improve energy security. And with so much less exhaust spewed into the air, the effect on climate change could be lowered. The U.S. was trying to develop such a battery, but so were many other countries.

That interest led LeVine to the Argonne National Laboratory, one of the Department of Energy's 17 national labs. For the better part of two years he was given access to its Battery Department, emerging with a captivating book entitled *The Powerhouse: Inside the Invention of a Battery to Save the World*.

With the closure or winnowing of many of corporate America's industrial labs — not least the famed Bell Labs, which is a shadow of its once-mighty self — industry now relies heavily on the U.S. government's national labs for basic scientific research. Thus it was that scientists at Argonne, located in the Chicago suburbs, discovered the battery chemistry that made electric cars possible, called NMC (for nickel-manganese-cobalt). The Chevrolet Volt uses a version of NMC, as will, reportedly, the next generation of Nissan Leafs. This also suggests its drawback: The Volt only gets about 40 miles on pure battery power alone before it switches to its gasoline-powered engine.

The core of LeVine's book is about the effort to take the next big step: create a battery that can achieve five times that mileage, while still remaining stable and affordable. The scientists at Argonne labelled this effort NMC 2.0. The scientists make a number of painstaking advances, inching the chemistry forward, only to discover problems. One such problem is called "voltage fade" — an instability that is serious enough to make the battery unusable in an electric vehicle.

There is also a private company in LeVine's narrative, a start-up called Envia Systems. Licensing the advances made by Argonne, it claims to have solved the rest of the puzzle. LeVine told me that, for a long time, he fully expected that his book would end with Envia solving the riddle of NMC 2.0, and having a wildly successful public offering. But that's not what happens. As GM, Argonne, and LeVine eventually discover, the Envia claims were wildly exaggerated. Indeed, by the end of the book, scientists still haven't solved the voltage fade problem, and NMC 2.0 seems as far away as ever. Argonne wins a competition set up by the Department of Energy to create a "Battery Hub," in which more than a dozen national labs, universities and corporate partners will work together to completely rethink their approach to the conceptual leap the government —and everyone else —is hoping for.

There is grist in "The Powerhouse" for critics of President Barack Obama. He pushed for battery innovation just as he pushed for solar innovation. The latter gave us Solyndra; the former gave us Envia. Financing efforts to invent a new battery is, without question, a form of industrial policy.

But LeVine thinks this view is misguided, and so do I.

"France and Germany and China have renewed their push for electric cars," he says. "The stakes are so high and the dividends so rich that they keep going" — even if the quest seems, at times, quixotic. — © **New York Times News Service**

Abbott calls for closing the gap with Aborigines – *The Hindu*

Prime Minister Tony Abbott on Wednesday described Australia's failure to end the entrenched disadvantage of Aboriginal people as "profoundly disappointing."

While progress had been made in some areas such as health and education, most goals were not being met and more work needed to be done for the country's most impoverished community, the Prime Minister said.

"This seventh 'Closing The Gap' report is in many respects profoundly disappointing," he told Parliament. He was referring to the yearly report on the divide between Aborigines and other Australians. "Despite the concerted efforts of successive governments since the first report, we are not on track to achieve most of the targets."

Opposition Labour Party leader Bill Shorten said the report presented "two nations, two Australias." Criticism also came from the country's first Aboriginal woman elected to Parliament, Senator Nova Peris, who said the country "had a lot to be ashamed about in the treatment of Australia's Aboriginal and Torres Strait Islander peoples."

The report aims to improve the lives of Australia's Aboriginal peoples, many of whom live in remote and poor areas and have significantly lower life expectancies than other Australians, by setting targets on health, education and mortality.

Met and unmet targets

The Prime Minister said mortality rates were lower, child and maternal health had improved and rates of heart disease had also improved among Aboriginal and Torres Strait Islanders. Also, gaps in high school completion and mortality rates appeared within reach.

But, he said, other targets including closing the gap in life expectancy within a generation and halving the gap in reading and numeracy in children had either had not been met or were not on track.

"This is not because of any lack of good will or effort by successive governments," he said. "We are trying to change entrenched and multigenerational disadvantage. This won't happen overnight. And it may not ever happen, unless we continue to place high demands on ourselves of what we must achieve together."

There are about 5,00,000 Aborigines in a total population of 23 million in Australia. —

AFP