veda is an holistic approach and comprises of lifestyle, food and medicine. Further, medicine covers three groups, i.e. herbal, herbomineral (metallic/bhasmas) and animal products.

To my surprise, the article indicates that the products made by ADMA (Ayurvedic Drug Manufacturers Association)-associated companies are equally contaminated as those made by AHPA (American Herbal Products Association) member companies of US. Rather, Indian products were comparatively cleaner (19%) than the US-manufactured products (21%). These data suggest that heavy-metal contamination in herbal products is a universal problem and not only related to India. Therefore, a consolidated effort should be made to solve this issue. In my view, the Indian Government must take up this challenge with the help of International organizations such as WHO, World Bank or the group of Developed Nations.

There is an urgent need to develop a decentralized testing facility, which should be quick, affordable and easily accessible to Indian manufacturers. They must be networked and utilized, under one umbrella, to facilitate the testing of raw materials and finished products of the Indian manufacturers. A national coordinator should be appointed for this task with immense flexibility and funding.

Based on public data, there are about 8000 licensed pharmacies in India, but only a few of them are major exporters. However, I am sure that many AHPA member companies in the US are buying ayurvedic products in bulk from these manufacturers and reprocessing under their names, which might be permissible under the law of the land. Thus, these US buyers should be educated to buy tested products and the Indian companies should be advised to outsource this testing facility, because maintenance of a science laboratory with sophisticated equipment and expensive manpower is beyond the reach of most of them.

Since the ayurveda drug manufacturing sector is not well organized in our country, it should be encouraged as a small-scale industry rather than a mega industry. One has to keep in mind that the drugs should be prepared in small batches and they should be consumed within 2–4 months. If these 8000 companies are networked, they can prove to be the strength of India, rather than a burden for making so-called spurious drugs in the name of ayurvedic drugs.

Lastly, more emphasis should be given on quality of raw materials, because it is collected from wildly grown sources and not cultivated. Therefore, proper identification and thorough washing of these raw materials is the only approach to make cleaner products, according to the WHO guidelines. Further, proper networking of herb-collectors and traders is important, because India is a vast country with great biodiversity and a plant easily available in one region may be an endangered species in another.

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Indian science and technology in a scientometric perspective

The editorial 'Scientometrics: A Dismal Science' by Balaram[1] has brought into focus the need to evolve a satisfactory system for evaluating the impact of scientific publications. One may consider scientometrics to be a necessary evil. However unscientific it may be, scientometrics has yielded some concrete indicators helpful for policymakers. Balaram observes that 'the inability of many scientometrists to appreciate the need to check their data and carry out control analysis renders many studies carried out in India almost useless'. One may note here a couple of scientometric studies by Gupta and Dhawan[2,3] conducted in India, in accordance with well-established methodology. Individual scientists and institutions can check the data used in these studies. These studies have been conducted in the National Institute of Science, Technology and Development Studies (NISTADS), New Delhi. Indian scientometrists need to take serious note of Balaram's observations and make necessary efforts to raise the standards of their studies, so that their works will benefit science and the nation to the fullest extent.

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Time for methanol revolution

Today's fuel crisis can only be overcome by the use of safer and cleaner alternative fuels. The potential of alternative fuels lies in the fact that when used in vehicles, they emit lesser amount of polluting gases and they are generally derived from renewable sources. Today, we have options such as bioethanol from lignocellulosic biomass, hydrogen gas, and biodiesel from microalgae and methanol which can be used as alternative fuels. We have earlier emphasized the need for bioconversion of lignocellulosic waste to bioethanol[1]. Ramesh Maheshwari also provided an insight about the usefulness and a comparison of the microbial species involved in the production of bioethanol[2]. However, keeping in mind the Indian population and immediate energy needs, methanol has a high potential for being used as an

alternate fuel. When blended with 15% gasoline, it is used as M85. China has approved a national standard for methanol-blended gasoline so as to develop a substitute for gasoline. Methanol possesses high octane rating and can be made either biologically or chemically from almost all organic compounds ($CO_2 + 3H_2 \rightarrow CH_3OH + H_2O$). It can also be produced from carbon dioxide present in the air or captured from industrial emissions which are a major cause of pollution and thus has an upper hand over ethanol produced from food crops such as corn and sugarcane.

Thus it can at the same time act as a CO_2 sink, reducing the amount of CO_2 being released into the atmosphere. However, major advancements are necessary for this technology to be made economically viable. As of today we do not have absorbents which can absorb even low concentrations of CO_2.

Methanol as a fuel offers several benefits in terms of emissions when compared to gasoline[3]. It reduces hydrocarbon emissions by 40% with M85 and 80% with M100. Emissions can be further cut down with fuel-cell vehicles using methanol rather than the existing vehicles based on internal combustion engines. Even the amount of nitrogen oxide released is low due to higher heat of vapourization. Very low particulate emissions are produced. The basic reason for lower levels of exhaust emissions is that it combusts more completely than gasoline and it contains no aromatic compounds; thus no benzene is produced.

Most people argue that methanol is toxic when compared to ethanol, but so is gasoline. Although it is slightly more toxic than gasoline, being easily biodegradable, spills of methanol persist for shorter duration in the environment when compared to petroleum spills[4]. Another argument is that it is corrosive, but it is only a disadvantage if we use it in the present engines, not in case of especially modified or designed engines for methanol or in case of flexi-fuel cars. The extra production cost is also not much. When we compare methanol and ethanol, we can also see that the system and conversion efficiency are higher in the former, and also the production cost is lower. Methanol is cheaper than gasoline, but has low energy content. Therefore, overall cost of using methanol is slightly higher than gasoline, but the net benefit is more.

An example is that many racing cars have been running on M85 for sometime now. This clearly shows its potential to be used as a fuel. Once the technological advancements have been made and efficient fuel-cell vehicles are available in the market, there is no stopping the methanol revolution.

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Bharatpur wetland: future desert?

The Keoladeo National Park (KNP), better known as the Bharatpur Bird Sanctuary, is one of the world's most renowned wetlands, famous for its avifauna. It is spread over 28.72 km^2 and located on the western edge of the Gangetic plains, at the confluence of rivers Gambhir and Banganga. The KNP is part of the Indo-Gangetic Plain with elevations ranging from 173 to 176 msl. The area is semi-arid, with an average rainfall of 500–700 mm, though rainfall can vary greatly from year to year. Considering the importance of the wetland, the area was designated as a National Park in 1981. It comprises three major ecosystems, namely wetland, grassland and woodland. Around 370 species of birds and 375 species of flowering plants have been recorded in the area. The star of the place used to be the rare Siberian crane (*Grus leucogeranus*), commonly known as 'snow wreath' or 'lily of birds', which had made the Park its home during the winter months. But today, sadly not a single bird of this species migrates to the Park. The Park is renowned globally for its heronries and is called the 'Mecca of bird watchers'. Because of its great ecological value, the huge congregation of birds and a wide variety of species, KNP was selected as a Ramsar site[1] in 1981. In December 1985, UNESCO declared it a World Heritage Site[2]. Rare birds from as far as Afghanistan, Turkmenistan, China and Siberia visit the Park during the winter months. The wetland is home to many vulnerable and critically endangered species[3] like Oriental white-backed vulture (*Gyps bengalensis*), Siberian crane, Spot-billed pelican (*Pelecanus philippensis*), Lesser adjutant (*Leptoptilos javanicus*), Indian skimmer (*Rynchops albicollis*), Sarus crane (*Grus antigone*), Baer's pochard (*Aythya baeri*), etc. This site is also considered an eco-fragile area because water – the life supporting system for KNP – is being totally controlled by humans.

A unique feature of the wetland ecosystem of KNP is its origin from a natural depression, which was an evanescent rainfed wetland[4]. Subsequently, the construction of Ajan Bandh and several sluice gates in the periphery of the KNP facilitated to contain and regulate the water level. Regular flooding and flushing of the wetlands is the only way to manage them. Today KNP is facing a huge shortage of water. With a growing shortage of water and feed, the birds no longer find the Park suitable. The dwindling bird population here had prompted UNESCO to issue a notice to the Bharatpur wetland in 2008 that, if the water table continues to fall and the number of migratory and local birds here keep falling, it would have no option but to withdraw its World Heritage status. The rich diversity of avifauna is in jeopardy if the government-proposed water diversion for irrigation takes place soon. The KNP requires about 550 million cubic feet (mcft) water for maintenance of wetland ecosystem. In recent years, only 300 mcft of water flow is possible due to poor rain, which has resulted in the drying of the woodland and wetland flora. Construction of the Panchana dam near Karauli in 2003, which is about 90 km upstream from KNP on the Gambhir