rocks[7]. This fact alone indicates that many aspects relating to the origin of petroleum need to be revised. Thomas Gold[8], a distinguished proponent of the non-organic theory, has expanded the application of the non-organic theory to all hydrocarbons, including coal.

In this connection, an international conference on 'Oil in Granite' was held recently in Kazan, Tatarstan, Russia[9]. One of the papers by Kosachev *et al.*[10] from the Institute of Organic Physics and Chemistry, Russian Academy of Sciences, Kazan, concluded that much evidence existed in favour of the theory, and that viable mechanisms for the creation of migration pathways existed.

Recently, C. Warren Hunt, a geologist of the Anhydride Oil Corporation, Calgary, Canada, has proposed a variant of the non-organic theory[11]. This novel theory sets forth the notion that upwelling deep non-organic methane is bacterially modified into petroleum at shallow depths.

In conclusion, although an organic origin of primordial Archaean petroleum is possible, it is far more natural within the non-organic framework. In recent years, the non-organic theory has been gaining wider acceptance. The discovery of the 'Deep Biosphere', the new world of underground bacteria, is another interesting development which may help to shed more light on the origin of petroleum.

1. Sankaran, A., *Curr. Sci.*, 1999, **76**, 868–870.
2. Abbas, S., *Curr. Sci.*, 1996, **71**, 677–684.
3. Dutkiewicz, A., Rasmussen, B. and Buick, R., *Nature*, 1998, **395**, 885–888.
4. Brown, R. H., Dale, P. C., Pendleton, Y. and Veeder, G. J., *Science*, 1997, **276**, 937–939.
5. Jackson, M. J., Powell, T. G., Summons, R. E. and Sweet, I. P., *Nature*, 1986, **322**, 727–729.
6. Sankaran, A., *Curr. Sci.*, 1997, **73**, 495–497.
7. Russell, R. O., *Oil Gas J.*, 1995, p. 34.
8. Gold, T., *Am. Sci.*, 1997, **85**, 408–411.
9. Proceedings of the Conference on Oil in Granite, Kazan, Tatarstan, Russia, 17–19 December 1997, Polar Publishing, Calgary, Canada, 1998.
10. Kosachev, I. P., Romanova, U. G. and Romanov, G. V., in Conference on Oil in Granite, Kazan, Tatarstan, Russia, 17–19 December 1997, Polar Publishing, Calgary, Canada 1998, paper no. 23.
11. Hunt, C. Warren, *Expanding Geospheres: Energy and Mass Transfers from Earth's Interior*. Polar Publishing, Calgary, Canada, 1992.

SAMAR ABBAS

Department of Physics,
Utkal University,
Bhubaneswar 751 004, India

Hybridization in Heteropneustids

A recent report published by Sridhar and Haniffa[1] prompted me to write this letter. The authors claim that '... reports on hybridization among the Heteropneustid species are nil. With the exception of a previous investigation on intergeneric hybridization involving *Clarias batrachus* × *H. fossilis*[2], no work has been attempted on hybridizing Heteropneustid species'. This is a sweeping statement, as we have earlier reported the intergeneric hybridization between *H. fossilis* and *C. batrachus*[3]. Subsequently, we confirmed true hybrid formation, rather than androgenesis or gynaegenesis, by molecular hybridization of isolated genomic DNA using ribosomal RNA gene probe[4]. Lastly, we also reported the *Clarias* dominant physical features of reciprocal hybrids between these two catfishes[5].

1. Sridhar, S. and Haniffa, M. A., *Curr. Sci.*, 1999, **76**, 871–873.
2. Mukhopadhyay, S. M. and Dehadrai, P. V., *Matsya*, 1987, **12–13**, 162–164.
3. Chaudhuri, A. and Mandal, R. K., *Indian J. Exp. Biol.*, 1979, **17**, 1150–1151.
4. Ghosh, B., Datta, U., Roy Choudhury, S. and Mandal, R. K., *J. Genet.*, 1991, **70**, 169–179.
5. Padhi, B. K., Datta, P. and Mandal, R. K., *Indian J. Exp. Biol.*, 1995, **33**, 433–436.

R. K. MANDAL

Department of Biochemistry,
Bose Institute,
P-1/12 CIT Scheme VIIM,
Calcutta 700 054, India

NEWS

A sturdy lead acid car battery using acid gel*

In the traditional car batteries, lead plates are immersed in dilute sulphuric acid. A reputed battery manufacturing company has now designed a new battery, which they think, is much better than the conventional batteries. It also uses the lead–acid mix to generate electricity, but the metal is wound into a tightly cylindrically coiled mesh covered with an acidic gel. The mesh retains the semi-solid acid gel firmly and so unlike in conventional battery technology the acid cannot spill. This battery is called Select Orbital Exide Battery. The price of this battery is stated to be about 50% more than the normal battery. The conventional automotive battery is expected to last about

*Extracted from *Professional Engineering*, 1999, **12**, 14.

40 months for the typical motorist. However, in hot and moist weather, the average life can fall 30 months or less. The Select Orbital, according to the manufacturers of the new design, is expected to last at least five years (60 months) under all conditions and the battery can survive heat, wet weather as well as shocks. It can also sit completely discharged for a full year without going dead. There are other advantages of this battery. It will not freeze in cold weather and users never need to add water and the battery does not vent hydrogen which is normally a by-product of conventional batteries (which can be explosive). The battery can therefore be mounted anywhere in the car, even in the passenger compartment. This is the first commercial battery available which uses the mesh and gel technology and these batteries are at present available in Europe and in USA, and are expected to be distributed all over the world.

S. Ramaseshan, Raman Research Institute, C. V. Raman Avenue, Sadashivanagar, Bangalore 560 080, India

Ecology in India

The study of ecology and environmental science has assumed great significance, particularly during the second half of the 20th century. While ecology deals with the study of structure and function of nature, environmental science with somewhat vague boundaries, is primarily concerned with how humanity affects and in turn is affected by other living organisms and the non-living physical environment. Environmental science has to be strongly biocentric; the holocoenotic environment is the object and ecology is the science that deals with it. Ecology therefore must be at the core of any environmental science programme. Ecology provides the most scientific approach and methodology to understand and evaluate the present day environmental crisis, and to find ways and means to resolve the crisis so as to ensure a better tomorrow for the human race. Resolution of burgeoning environmental problems is not possible without a thorough understanding of ecological principles, and therefore appropriately trained ecologists (both generalists and specialists) will be required increasingly. The new generation of ecologists will require the capability to predict, plan and manage the environment and resources.

From a small beginning, ecology has emerged into a frontline science by the turn of the 20th century. From the conventional regional floristic and vegetation studies the switch over to ecosystem approach in the late fifties and early sixties, the concerted worldwide productivity studies under UNESCO's International Biological Programme (1964–74) and then incorporation of 'man' as part of biosphere in UNESCO's Man and the Biosphere (MAB) Programme followed by inclusion of geosphere also in the International Geosphere Biosphere programme, have shaped ecological researches to a great extent. Widespread environmental degradation and catastrophic episodes have generated serious concerns and environment-friendly growth in agriculture, forestry, urban and industrial systems by holistic management methods has been advocated. On the international scene, from the 1972 Stockholm Conference on Human Environment to the 1992 Earth Summit in Rio de Jeneiro and through activities of UNEP, the United Nations have taken periodic stock of the situation and given directions for the future.

Ramdeo Misra (1908–1998)

A national seminar on 'Ecology in India: Retrospect and Prospect' was organized by the Centre of Advanced Study in Botany, Banaras Hindu University on 12–13 March 1999. Eminent scholars who have actively contributed to different aspects of ecology were invited to this seminar to review the progress of the subject in India and to outline the future directions required. Major issues discussed in the seminar were: (i) structure, functioning and management of major ecosystems such as forest, grassland, savanna, agroecosystem, wastelands, river, and lakes; (ii) sustainability of natural resources; (iii) conservation and monitoring of biological diversity, damaged ecosystems; (iv) ecology of noxious weeds; (v) causes and consequences of global change; (vi) socio-economic issues in environmental management; etc. Both oral and poster presentations were made.

The seminar was inaugurated by Y. C. Simhadri, Vice-Chancellor, Banaras Hindu University, who emphasized the role of higher education to promote sustainable development and environmental protection. Simhadri also highlighted the fact that environmental education at the university level is necessary for students to apply ecological principles to analyse environmental issues. While dedicating the seminar to the memory of late Ramdeo Misra, J. S. Singh highlighted contributions of Misra who laid the foundations of ecology and environmental science in the country. He was aptly called 'Father of Indian Ecology' by the ecologists world over. Misra breathed his last on 25 June 1998 in New Delhi and India