Astrology and science

The UGC has certainly stirred a hornets' nest by its ridiculous decision to promote courses in astrology and palmistry. It does not require a great deal of common sense to know why the UGC was bulldozed into this decision, which is a giant leap backwards for science in this country. Astrology is not a religion, it is a subject that comes cloaked in the garb of pseudo-science, purporting to make definitive predictions on human affairs based on planetary conjunctions. Khushwant Singh, in his column 'Sweet and Sour' mentions numerous examples of astrological predictions made by 'eminent' astrologers which fell flat. Let us erase words like 'Rahukala', 'Yamagandkala' and 'Gulikakala' and all the mumbo-jumbo of astrological and vaastu vocabulary from our lexicon. This is not meant to belittle the role of spirituality and even the most rational scientist believes that spirituality and science can co-exist and complement each other. Jayant V. Narlikar has been the most vocal and has written to the UGC Chairman expressing the deep anxiety of the scientific community against this retrograde step. What was most distressing was that his and Balaram's (editorial *Curr. Sci.*, 2000, **79**, 1139 was the first to expose the grand designs of the UGC) have been lone voices among the 10-lakh strong scientific community in this country. There has not been any protest from the Indian Science Congress which organizes a yearly Kumbhmela inaugurated by the Prime Minister. And what about the other science organizations in the country and the academies. Why do they have to toe the UGC line? Let scientific thinking and a rational bent of mind prevail. Didn't Tagore himself say in his great poem *Where the mind is without fear*: 'Where the clear stream of reason has not lost its way into the dreary desert sand of dead habit, Into that heaven of freedom, my Father, let my country awake'. Let us fight to prevent our academic institutions from becoming a haven for 'sadhus and sanyasis', who will soon join the academic stream as teachers, flaunting their degree in astrology, witchcraft and palmistry. My good friend Ganeshaiah, himself one of the finest evolutionary biologists in this country, indirectly endorsed the decision of the UGC in a recent letter in this journal (2001, **80**, 719–720). His argument being (and I must confess a strong one) that we should not discard an initiative like this just because it is a pseudo-science, but give it time *to kill itself* if it does not have the strength to stand alongside the well-grounded science stream. Good logic, but let me ask him a simple question. If he was giving a talk on say 'Long-term strategies for bio-conservation of medicinal plants in the BR hills: Vision for 2020' and an astrologer scientist (say with a Ph D in Jyothir Vigyan from Banaras or Osmania University; yes Osmania University too has taken the bait, i.e. funding for a full-fledged department with positions, contingency funds etc.) said that according to planetary predictions, long-term studies would be an exercise in futility, because the world would end soon as we are in *Kali-yuga*, what would be his response? Let me guess. He would say, 'My dear sir, keep your Jyothir Vigyan degree to yourself. We scientists will always plan for research not just 20 years from now, but even 100 years from now. That's how we are trained to think, with logic and reasoning'.

V. R. SASHIDHAR

Department of Crop Physiology,
University of Agricultural Sciences,
GKVK Campus,
Bangalore 560 065, India

Diagenetic rare earth phosphates

The article by A. V. Sankaran on diagenitic rare earth phosphates (*Curr. Sci.*, 2001, **80**, 818–820) is very informative and can be used for dating Proterozoic metasedimentary formation, where there are records of these minerals. This information can be applied in Rajasthan where there is lack of geochronological data in Proterozoic metasedimentary formation of Aravalli Supergroup.

There is one additional information which the author has missed. The oldest records of early crust is 4.2 b.y. recorded from Mount Narryers and Jack Hills, Western Australia[1,2] and not 4.03 which the author has mentioned in the article. This information has been gathered from detrital zircons derived from quartzites occurring in above-mentioned localities. This is the only evidence to probe in the era of Hadaean.

1. Amelin, Yuri, Lee, Der-chuen, Haliday, Alex, N. and Pidgeon, Robert, T., *Nature*, 1999, **199**, 252–255.
2. Mass, R., Kinner, P. D., Williams, T. R., Froude, D. O. and Compston, W., *Geochim. Cosmochim. Acta*, 1992, **56**, 1281–1300.

VIVEK LAUL

Department of Geology,
M.L. Sukhadia University,
Udaipur 313 002, India

Response:

The 4.2 b.y. zircon from Mt. Narryer and Jack Hills, W. Australia, pointed out by Vivek Laul represents the mineral-age and not the age of the host rocks–quartzites and conglomerates, which are much younger. In fact, still older zircons dated 4.4 b.y. have also been reported last year from the same locality[1]. Zircons in these rocks are detrital in origin, derived from an earlier crust, probably a granite, which like many of the early-formed crusts, must have had brief geological existence. Unlike these transient early crustal rocks, the Canadian occurrence of 4.03-b.y.-old zircons, quoted in my article (*Curr. Sci.*, 2001, **80**, 818–

820), represents the age of the rocks–metatonalites and metagranodiorites, in which the zircons had crystallized as typical accessory mineral. These meta-igneous rocks are the only ones, so far discovered, to have survived till today and hence constitute the *Oldest preserved crust*. In the absence of the parent rocks, the 4.2–4.4 b.y. zircons from W. Australia only confirm that crustal development was active within half-billion years of formation of the earth and that a few of these early-formed crusts must have remained stable for some time to be weathered and the zircons deposited elsewhere.

1. Report on the Annual Meeting of Geological Society of America, *Science*, 2000, **290**, 2239–2242.

A. V. SANKARAN
10, P&T Colony,
I Cross, II Block, R.T. Nagar,
Bangalore 560 032, India

NEWS

Nuclear power statistics for 2000*

A total of 438 nuclear power plants were operating around the world at the end of 2000, according to data reported to the Power Reactor Information System at the International Atomic Energy Agency (IAEA). The plants had a total net installed capacity of 351 GW(e). Also during the year 2000, six nuclear power plants representing 3056 MW(e) net electric

Table 1. Nuclear power reactors in operation and under construction during 2000

	Reactors in operation		Reactors under construction		Nuclear electricity Supplied in 1999		Total operating experience	
Country	No. of units	Net capacity MW(e)	No. of units	Net capacity MW(e)	TW(e)-h	% of total	Year	Month
Argentina	2	935	1	692	5.73	7.26	44	7
Armenia	1	376			1.84	33.00	33	3
Belgium	7	5712			45.40	56.75	170	7
Brazil	2	1855			5.55	1.45	19	3
Bulgaria	6	3538			18.18	45.00*	113	2
Canada	14	9998			68.68	11.80	433	2
China	3	2167	8	6420	16.00	1.19	23	5
Czech Rep.	5	2569	1	912	13.59	18.50	58	9
Finland	4	2656			21.06	32.15	87	4
France	59	63073			395.00	76.40	1169	2
Germany	19	21122			159.60	30.57	591	1
Hungary	4	1755			14.72	42.19	62	2
India	14	2503			14.21	3.14	181	5
Iran			2	2111				
Japan	53	43491	3	3190	304.87	33.82	962	8
Korea, Rep. of	16	12990	4	3820	103.50	40.74	169	2
Lithuania	2	2370			8.40	73.68	30	6
Mexico	2	1360			7.92	3.86	17	11
Netherlands	1	449			3.70	4.00	56	0
Pakistan	2	425			1.08	1.65	29	10
Romania	1	650	1	650	5.05	10.86	4	6
Russia	29	19843	3	2825	119.65	14.95	671	6
South Africa	2	1800			12.99	6.58*	32	3
Slovak Rep.	6	2408	2	776	16.49	53.43	85	0
Slovenia	1	676			4.54	37.38	19	3
Spain	9	7512			59.30	27.63	192	2
Sweden	11	9432			54.80	39.00	278	1
Switzerland	5	3192			23.54	38.18*	128	10
UK	35	12968			78.30	21.94	1238	4
Ukraine	13	11207	4	3800	72.40	47.28	240	10
USA	104	97411			753.90*	19.83	2559	8
Total	438	351327	31	27756	2447.53		9819	11

Note: Asterisk is estimate.
The total includes the following data in Taiwan, China: 6 units, 4884 MW(e) in operation; 2 units, 2560 MW(e) under construction; 37 TW(e)-h of nuclear electricity generation, representing 23.64% of the total electricity generated there; 116 years 1 month of total operating experience.
One reactor was shut down, Chernobyl 3, in Ukraine in 2000.