

Notes

PUBLICATION NORMS FOR FOSSIL FINDS

Like many other natural sciences, Palaeontology is primarily based on deductive logic and interpretations. Accordingly, it needs a strong data base which, in addition to being precise and accurate, has to be reproducible. While there is a Zoological Code of Nomenclature governing the taxonomy, which is followed by palaeontologists as well, there does not appear to be a mandatory code governing the publication of fossil finds and reports. Several standard journals of the world and many Society publications do insist on minimum requirements but bulk of the publications, especially 'new finds' do not appear in such journals. This creates the problem of reproducibility and the relevance of such data to palaeontological interpretations becomes doubtful.

India has a long tradition of research in Palaeontology which dates back to the middle of the last century. Some of the publications on the invertebrate, vertebrate and plant fossils still constitute the basic data for nomenclature of several taxonomic groups. Most of the fossil collections made towards the later part of the last century and earlier part of the present century were so meticulous that there has been absolutely no problem in locating the horizons subsequently, in spite of the fact that the stratigraphic principles followed those days were of an elementary type. While the nomenclature in these publications needs to be updated, the reproducibility is beyond doubt.

In recent years, however, there has been a rush of reports of 'new finds'. Most of these reports appear in journals where there is no system of refereeing, especially some university and institutional journals and others published by individuals. This includes several journals published outside India. These reports comprise a few lines naming an odd new fossil collected from a locality. Needless to mention that such reports are not only useless to science but positively harmful; even if they are genuine, since without a stratigraphic context, they tend to generate erroneous interpretations. The present day palaeontology has reached a stage of breakthrough in evolving concepts of provincialism, palaeoecology and palaeogeography based on global and facies distribution of fauna and flora. The palaeontological data taken together with data available from advanced and specialised techniques in palaeomagnetism, geochemistry and geochronology have helped in understanding the fundamental aspects of the tectonic evolution of the earth's lithosphere. The precise location of fossils contributes to this and expands the data base for interpretations on faunal provincialism and localisation and elucidation of earth's history in space and time. A wrongly listed or an incompletely listed form can create havoc in such interpretations. Accordingly, there is hardly any need to emphasize the importance of precision in fossil reporting. Evolving a code for fossil reporting is long overdue especially in the light of some recent unfortunate controversies.

There are norms followed by some standard journals but these need to be reiterated so that they are meticulously adhered to and rigorously enforced. Besides, it is necessary to generate a debate among the palaeontologists and editors

so that these norms are improved and standardised. It is with this purpose in mind that some of the desirable principles are outlined below.

1. No report of a fossil should be published unless it is accompanied by the following information :

- (a) a precise location map which should enable the reader to reach within the radius of 50 metres of the outcrop. Giving the Latitude and Longitude is not enough and it should be accompanied by the location with respect to roads, pony tracks, foot paths, physiographic or other permanent landmarks.
 - (b) a stratigraphic column either based on the author's own work or other published work wherein the position of the occurrence of the new form is plotted in relation to already reported forms from the section. If many specimens of the same taxon have been collected, their tentative range in the column should be indicated.
 - (c) a complete description of the taxa/taxon being reported as per the Code of Nomenclature including diagrams. The repository should be positively indicated.
2. In case of microfossils, detailed description of the rock type which has yielded the fauna should be incorporated.
 3. If there is more than one author to the publication, it should be specified as to who made the collection.
 4. While faunal descriptions and interpretations of the same may be published separately, the latter should succeed and never precede the former. If the description is still in the press, the name of the journal where the publication has been accepted should be included in the references while giving the interpretations.
 5. In no case should any report be published in order to claim 'priority' without first fulfilling the conditions mentioned above. Any such report, if published, should be considered as invalid and no interpretation based on it should be published.

The rules mentioned above would indicate the minimum requirements for an objective report of new fossils. Not only would such a report become worthwhile for scientific interpretations but the reproducibility of the forms and the accountability of the author/s would be ensured whenever some doubts arise. While the responsibility of the objective and faithful reporting always lies with the authors, every worker should be in a position to discriminate between the genuine and spurious reports. The editors and the referees will have to be vigilant in this respect, if ugly controversies have to be avoided.

IGCP PROJECT 280: FIELD TRIP AND WORKSHOP IN ALDAN SHIELD, EASTERN SIBERIA

The Soviet Committee of the IGCP Project 280, on 'The oldest rocks on earth' organised an International geological excursion to the Aldan-Stanovik Shield region of eastern Siberia, U.S.S.R. during July-August, 1989. It was for the first time that geologists from outside the Soviet Union were invited to visit remote places in Siberia. The team comprised 22 geologists from different institutions in the Soviet Union and same number from outside. The participants from outside the Soviet Union included representatives from China, India, Australia, South Africa, France, West Germany, England, U.S.A. and Canada. Notable participants were Alfred Kroner, S. Moorbath, Bor-ming Jahn, Nick Arndt, H. Baadsgard, J. M. Burton, John Myers, Z. Peterman, R. Pidgion, Donald Lowe and others. Besides myself, Prof. R. S. Sharma was the other Indian participant.

The Soviet organising committee led by Professor V. Rudnik of the Institute of Precambrian Geology and Geochronology, Leningrad, had made elaborate arrangements for the field trip, and met the entire expenditure on lodging, food and transport. The starting point of the excursion was Niriungri—an Yakutian city on the bank of the Aldan river, a tributary of Lena. The camp for the first leg of the field trip was in three Railway coaches stationed at a small Siberian settlement, Olekma. There were two other camps on the banks of Olondo and Aldan rivers where the field party stayed in tents in the Taiga forests.

The Aldan-Stanovik shield in eastern Siberia is a region of high rugged mountains. The climate was mild as it was summer time. In the higher reaches, however, night temperatures often dropped below freezing point. The outcrops being few and far between we used to be dropped by helicopters. At places the transportation was by caterpillar tanks. Speed boats were used for ferrying across the network of rivers.

The Aldan-Stanovik is a major salient of basement of the Siberian craton bounded in the south by Mongol-Okhotsk fault and platform covers in the north. A prominent suture zone (the Stanovik suture zone) separates the northern tectonic domain (Aldan) from the southern (Stanovik). In the Aldan shield region there is a central, fault bounded granulite-gneiss terrain (GGnT) occurring between two greenstone terrains (GGT), the Olekma GGT in the west and Batomga GGT in the east respectively. Thrust nappes are widespread within the granulite-gneiss terrain. Major overthrusts occur at the boundaries of the zones which differ in lithology and degree of metamorphism. The thrust zones are marked by widespread mylonitisation and diaphthoretic rocks. The exhumed base of the Aldan allochthon comprises the deepest crust assemblages of granulite facies rocks of the region.

The Aldan GGnT includes several blocks of orthogneisses and supracrustal assemblages of early Archaean age. There are also some zones of late Archaean age which are transitional to the GGT, and late Archaean and Proterozoic mafic and ultramafic dykes. The infracrustal complex of trondhjemitic and granitic composition is dominated by enderbites, charnockitic gneiss and granitic gneisses that make up about 50% outcrop of the Aldan GGnT.

The Olekma GGT comprises several major structural-lithological units, such as an infrastructural tonalite-trondhjemitic gneisses, greenstone belts and complex of mafic granulites, enderbite gneisses and metasediments of granulite facies. The

tonalite-trondhjemite gneisses vary in age and origin. They include relics of unaltered early Archaean rocks, restites as well as late Archaean tonalites formed from melting of earlier deep-seated crust. Tonalites associated with differentiated gabbro-dioritic intrusions show Nd isotopic variations reflecting a primitive source.

The greenstone belts are rather small. The Olondo greenstone belt, the largest belt of this type, contains abundant mafic and ultramafic volcanics. The metamorphic grade is highest in this belt. The Tungurcha greenstone belt contains clastic metasediments and carbonate rocks of shallow water origin.

The field party visited almost all the type sections of the Aldan GGnT and the Olekma GGT. In addition to on spot discussions, there were daily workshops for synthesising the field observations and the chemical and isotopic data. Final synthesis was done in a 2 day workshop at Niriungri where most of the foreign participants presented their views and made comparative studies of the Aldan geology with that of the other shield areas of the world. For all the participants, it was indeed a grand experience.

The Soviet organizing committee took responsibility of despatching samples collected by foreign participants to their respective laboratories. They also expressed their desire for future international collaboration in studying the oldest rocks of the Soviet Union.

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JUSTIFICATION NOT BY FAITH, BUT BY VERIFICATION

"The improvement of natural knowledge absolutely refuses to acknowledge authority as such. For him, scepticism is the highest of duties; blind faith the one unpardonable sin. And it cannot be otherwise, for every great advance in natural knowledge has involved the absolute rejection of authority, the cherishing of the keenest scepticism, the annihilation of the spirit of blind faith; and the most ardent votary of science holds his foremost convictions, not because the men he most venerates hold them; not because their verity is testified by portents and wonders; but because his experience teaches him that whenever he chooses to bring these convictions into contact with their primary source, Nature—whenever he thinks fit to test them by appealing to experiment and observation—will confirm them. The man of science has learned to believe in justification, not by faith, but by verification."

HUXLEY

HUMANITY'S GREATEST ACHIEVEMENT

"The successful Grand Tour of the outer planets by Voyager 2 represents one of humanity's great achievements. The splendid outcome of the mission carried out in forbidding and hostile environment was due to exemplary exercise of imagination, ingenuity, careful design, and a high level of human-machine operational interaction. An essential ingredient was excellent engineering capability at the Jet Propulsion Laboratory (JPL) that had been nurtured by earlier Mariner missions to the inner planets.

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"One is left with a deep admiration for the quality of teamwork between humans and the spacecraft though they are nearly 3 billion miles apart. The humans safe on Earth have been able to use facilities of equipment and consultation to devise programming techniques that have wrung from Voyager 2, performance that was not imagined at blast-off on 20 August 1977."

PHILIP H. ABELSON

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