In Defence of Field-work and Mapping

We recently had occasion to draw the attention of our readers to the slowing pace of mineral discoveries in our country (Jour. Geol. Soc. India, v. 38, pp. 555-560). This lack of initiative and innovative thinking is to be traced to the non-availability of geological maps. Our performance in the field of map production has not been particularly commendable. The only available geological map of India on a scale of 1 : 2,000,000 was published as far back as in 1962 ! Excepting for the States of Karnataka and Rajasthan, there are no published geological maps of the rest of the States of the Indian union even on scales of 1 : 1,000,000. Apart from broad, regional geological maps on 1 : 250,000 scales (Quadrangle maps) the more important maps are those on scales of 1 : 50,000 and 1 : 25,000. Published maps on these scales are conspicuous by their absence. In their preoccupation with a large number of miscellaneous activities, a low priority appears to have been given by Geological Survey Departments both at the Centre and States to mapping activity. This should not be. The prime duty of a Geological Survey is to provide up-to-date geological information in a continuous stream. It is only such an effort that can contribute to the wise management of the nation's natural resources and promote the health, safety and well-being of its people. For, it is the geological map which contains a wealth of basic information about rocks and their interrelations. Presently, good geological maps rarely accompany a research paper. Even when it does accompany a report, it is reduced in scale to such an extent that its practical utility is entirely lost. Geological map is one which can give at a glance a perspective of an entire area. In fact, the best brains in this country should get involved in the preparation of geological maps.

In recent years many tall claims have been made of remote sensing and its value in mineral discovery. Whatever be the value of data supplied by satellites, they can never be a substitute to ground work and the preparation of a geological map, the outcome of painstaking

study by actually examining rock outcrops in the field. The neglect of classical geological mapping in favour of the new-fangled ideas about watching our planet from space is primarily responsible for the tardy progress in our mineral exploration effort. Top-most priority should have been given, in our opinion, to publication of geological maps on progressively larger and larger scales. This is the surest way of knowing more and more about our planet. Field work should, therefore, be encouraged instead of being the first casualty in the process of cutting down expenditure. The best way of teaching geology to students is to take them to the field and initiate them in the art of mapping. University professors will be doing service if they divert their attention from high-tech instrumentation research in laboratories to the direct observation of rocks in their field setting. Sound field observations are essential. Grandiose theories based on laboratory investigations have no place, if location of samples are not known and their geological relations are not clear. Outstanding papers published in international journals on a variety of sub-disciplines of geology have concentrated on areas where excellent large-scale geological maps are available. We, therefore, plead for a larger allocation of funds for field mapping both in Survey Departments and Universities. Sponsored field trips should be encouraged. If the aim of college education is to discipline a student in self-education, field is the best place for imparting such an education. Read and Watson, the great teachers of geology had declared, "Geology is fundamentally an observational or field science. Minerals, rocks and fossils can be examined in the laboratory, but their geology — their mode of occurrence, their mutual relations and arrangement as indicating their history — must be studied out of doors". The field, therefore, is the proper place for teaching geology — any kind of geology.

Developments in the fields of geochemistry, geochronology, geophysics have meaning only when basic geological data are available. The new tendency to extol the work being carried out in these specialised fields, bestowing on votaries of these disciplines prestigious awards and membership to learned Academies, ignoring the claims of geologists engaged in field-mapping has been largely responsible for the weaning away of bright students from the classical pursuit of geology — the examination of rocks in the field. A device has to be worked out for recognizing and rewarding producers of the

best geological maps. The Geological Survey of India has the highest tradition in geological mapping and is the one organisation which has the necessary talent and is best equipped to pursue this activity with vigour. At present, field geologists who are turning out excellent work are frustrated because their work never sees the light of day and lies hidden in dusty files which nobody apparently reads. We repeat what we have stated before, that research without publication is like staging a drama without an audience. It is an exercise in futility. Maps prepared should get published and the field geologist given due credit. He should have the satisfaction of seeing his work being recognized by his peers. Such appreciation by fellow scientists will be a greater incentive to work than the conferring of a Bhatnagar award or election to the Fellowship of National Academies. The process of map preparation can be enormously rewarding, for it gives "an appreciation and understanding of our entire physical environment, present and past, to an extent obtainable through no other sciences".

Mapping should not be taken lightly. It should be undertaken with the firm conviction that it is the essence of geology. May be its results are ambiguous, but as stated by Toeffler, that although it does not "lift the veil, but moves it, and through tiny holes in the fabric a few rays escape which dazzle the eyes." To have such experience, an occasional field excursion will not do. The words of Pettijohn have to be recalled, "Understanding comes only from prolonged daily contact". There can be no substitute for continuous sound field observations and mapping.

We have so sadly neglected this fundamental study that there is a dearth of geologists who can map well. Good draughtsmen who can produce maps showing clear contrasts are also scarce, for there is no encouragement to their art. Maps "can be objects of beauty that kindle imagination and stimulate the uninitiated and experts alike". It is an art to be cultivated and get perfected with experience. We wish to enter a fervent plea for the cultivation of the art of geological mapping. "Direct observations in the field and mapping should remain the major foundation for our science" - (Pettijohn).

Greenley, noted field geologists of Scotland had this to say in praise of field work : "Our work carried on in solitude, ever in

presence of what we call 'Nature', with her never failing loveliness as our delight. To others too she is a joy, though most men think of her beauty and beauty only. To the geologist, however, she tells the story which is written over like a palimpsest, a story which we can but dimly read which haunts and calls with the calling of the half unknown. But even that is definite and tangible beside the pervading mystery of Nature as an outward and visible, standing forth an inward and invisible. For those to whom that vision comes their work takes a spiritual exaltation. They have seen -

> "Glories of the flashing of the shield, the earth
> And common face of Nature speaks to them of
> Rememberable things".

Is Scientific Fraud to be Glossed Over ?

Strange things are happening in the Panjab in the political as well as the academic scene. Professor V.J. Gupta who had stunned the academic world by his various acts of alleged scientific fraud of a serious nature is once again the limelight. A year ago he was placed under suspension as a consequence of the exposure of his guilt. It was expected that the University, after taking such an action, although belatedly, would take effective steps to hold an enquiry and come out with the truth. Instead, we find that after a whole year of inaction, the erring professor has been reinstated. Strangely, the reports of the two committees which went in to the allegations — the one constituted by the Geological Survey of India and the other headed by Dr. Paintal, past president of the National Science Academy — have not been published. This is most unfortunate and does not speak well of the progress of earth science studies in this country. We will be failing in our duty if we refrain from pointing out the serious damage being caused to the pursuit of healthy geological research by suppressing truth. Should scientific fraud be glossed over in this manner? Should Indian palaeontology continue to be under a cloud ?