

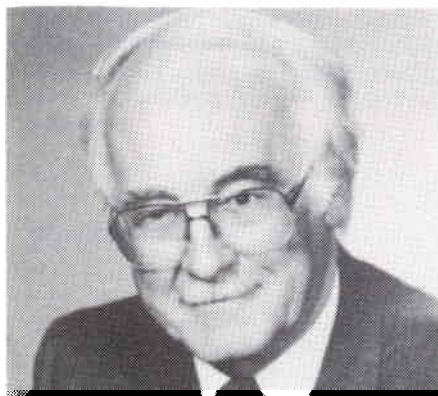
SMI BULLETIN

International Agency for Small-Scale Mining – Small Mining International (SMI)
L'Agence Internationale pour les Petites Exploitations Minières

Published quarterly
for the information of
the international
small mining community by the

Letter from the Chairman

by R.A. Blais



Prof. Roger A. Blais

It gives me real pleasure to introduce this first issue of the SMI News Bulletin to our friends from around the world. Through this vehicle we hope to stimulate increased interest in small-scale mining and provide useful information to all those who are looking for ways and means of improving their national or local economy through the exploitation of mines of all sizes, although the emphasis will be on small operations.

Mining technology has made giant strides during the last few decades. Economies of scale and improvements in machinery and transportation methods have resulted in operations of increasingly large magnitude and complexity. With the rising costs of labour and the growing complexity of mining equipment, many marginal operations have ceased to exist.

Consequently, as in other economic domains, the time has come to reassess the general situation. When systems get too big, they tend to breakdown and give rise to smaller, more efficient operations. Ensuing technological innovations serve shorter production runs and capitalize on flexible structures. The net results are higher productivity and operations that would not otherwise be viable.

The break-down of physical systems is usually followed by a re-evaluation of human organizations. For example, large organizations often tend to become bureaucratic, inflexible and anonymous, with management remote from the workers. As a result, the individual on the shop floor or in the field does not have much of a feeling for his organization's objectives and is not very motivated toward his work. This gives rise to entrepreneurial spin-offs or offshoots which are another form of breakdown of the larger systems.

While in recent years manufacturing systems have experienced these human and physical transformations, an appreciable mutation of that nature in the mining sector has not been witnessed. Perhaps the time has come to discover ways and means of promoting small-scale mining, not so much as an alternative to large-scale mining but as a complement to it.

Large mining operations have always followed the path of increased mechanization and automation in order to reduce labour and save on costs. However, apart from the strictly economic component we need to reappraise this position in light of social issues: jobs and the optimization of mineral resources are at stake. Thus, in addition to the traditional company operating, as it should, for maximum profit, should we not consider the need for a "social company" to maximize the efficient use of labour and the fullest exploitation possible of the available mineral resources? The latter approach may be complementary to the first one. It does not necessarily derive from a socialist ideology but rather from the capitalistic opportunities of creating new wealth.

Although my convictions rest with the merits of the capitalist, free-enterprise system, I am becoming increasingly aware of the need for social innovations to make the fullest use possible of available manpower and natural resources endowments. There is a real need for entrepreneurship in the exploitation of small mines just as mineral exploration has given rise to a large number of geoscience entrepreneurs.

Because numerous jobs are involved and because small mines can be profitable for the people exploiting them, there is a need to take a fresh look at the potential offered by many small mineral deposits. This need is particularly felt in developing countries. The possibilities offered by the new and the old technologies must also be carefully appraised in the light of the nature of the small orebodies to be developed and the local resources available. For example, would it not be possible to develop economic methods for breaking rock in situ without shattering its surroundings so as to allow the safe exploitation of very thin lode deposits without much dilution? Where and how best to apply modern techniques for mining, thus bridging the old and the new?

Above all, how can governments provide a favourable environment for small-scale mining operations to flourish? What forms of organizations are best suited for that purpose? What sort of cooperative arrangements could exist between small mine operators and large mining consortia that have access to certain world markets? Could mining cooperatives be considered in certain circumstances? What is to be learned from the experience of one country with a particular technology? What mining legislations in developing

countries have proven to be the best? Many more questions come to mind. I will leave to the readers of this News Bulletin and to others the visualization of the major issues involved. Nonetheless, it is already apparent that much could be obtained by sharing experiences in small-scale mining, including sociological repercussions, and disseminating this information widely.

This brings us to SMI and to the necessity of developing a worldwide forum and information exchange system on small-scale mining. Indeed, the main purpose of this first issue is to increase people's awareness about this activity and to provoke positive reactions such that an international small-scale mining information exchange program could be mounted. SMI was formed recently to provide the backbone to this necessary collaborative effort. Thanks to the generous financial support provided by the International Development Research

Centre (Ottawa, Canada), a secretariat was established which led to the incorporation of the International Agency for Small-Scale Mining (SMI), under Canadian law, as a not-for-profit organization.

On behalf of the interim Board of Directors I am happy to report that much interest has been raised about the possibility of undertaking a major international program of information exchange on small-scale mining. The new Board has met in December 1988, February and April 1989 and has prepared a major proposal to be presented to IDRC and other funding agencies.

Broadly stated this project proposes to study the technical and economic feasibility of creating an international small mining information system, comprising a database and networking activities, with data collec-

tion and dissemination points located in developing countries. We see this proposal as an excellent opportunity for an institution or association from a developing country to participate in the creation of a pilot program. We know that considerable interest exists for this concept both from the recommendations of numerous workshops and seminars over the last decade and from our extensive correspondence. To convince the funding agencies of the seriousness of our commitment, we call on scientists and mining professionals from developing countries to transform words into actions and take the initiative in proposing concrete ways to collaborate with SMI in developing this international information network. An excellent step in this direction taken by India and Zimbabwe is reported elsewhere in this News Bulletin. ■

Editorial

by E.H. Dahlberg, Vice-President, SMI

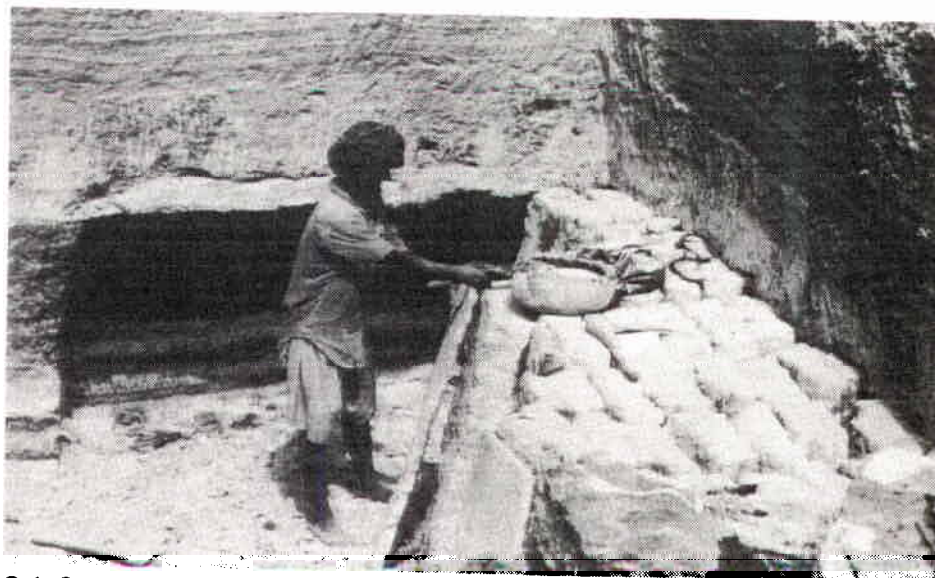
Poverty in the rural areas, especially in the developing countries, can be considered one of the most serious problems mankind is facing at the end of the 20th century. The resulting depopulation of rural areas coupled with growth of urban centres has caused a decline in food production, a decrease in the quality of life in urban areas and triggered an apparently irreversible process of alienation of man towards his habitat. In order to stem this process, economically viable alternatives have to be created in remote areas.

Small-scale mining has the potential to make a modest contribution by providing for relatively well-paying jobs, supplies of raw material for other industrial and agricultural activities and production of high unit-value commodities to earn foreign currency.

The actual onslaught on the environment in many parts of the world is frequently the result of a poorly managed exploitation of natural resources by people who are desperate to earn a living. Often, these outlying areas are beyond the control of central and state governments. Education and training therefore become a major feature of the total arsenal of measures available to promote an orderly development of rural economic

activities. Knowledge combined with man's natural desire for a better quality of life should contribute to sound entrepreneurship, a basic requirement for development. With the help of local professionals acting as intermediaries between Small Mining International (SMI) and the small miners in three-way partnership we anticipate benefits to all parties.

The present relationship between precious metals and gemstones small miners and government agencies is, in most countries, unsatisfactory. In the interest of small miners, and the overall improvement of life in rural areas, we believe there is considerable scope for improvement if appropriate policies and regulatory codes are adopted.

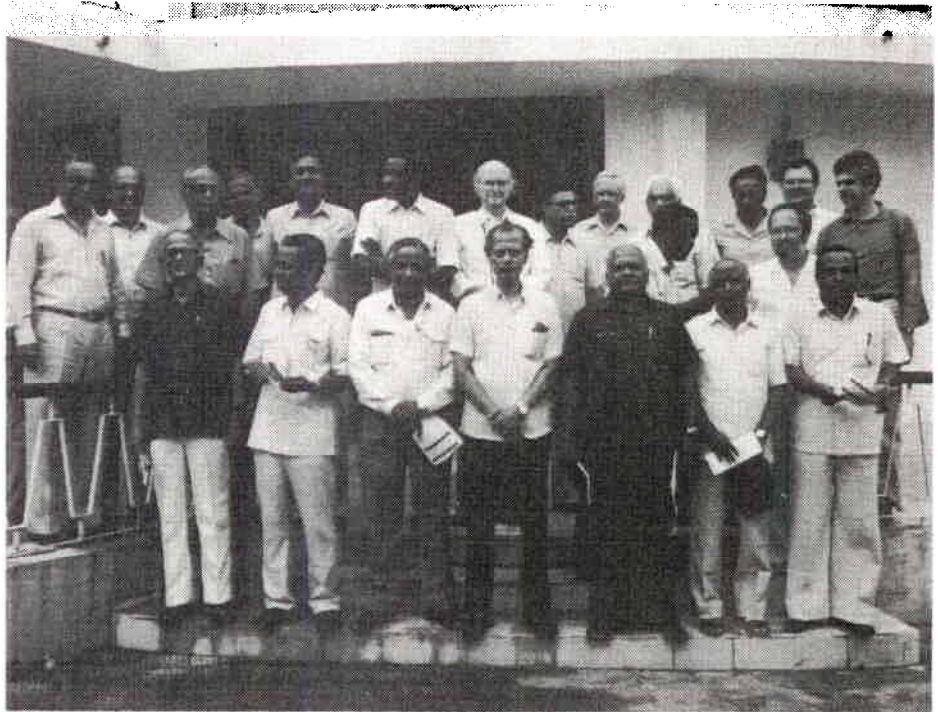


Salt Quarry in Agorgott, Northern Mali
(Photo courtesy of N. Petit-Maire, Marseille)

Industrial minerals have so far been neglected because they are both less volatile and glamorous. This sector, however, has tremendous potential given its contribution to economies of developing countries by providing the basis for local industries, with the value added during processing and manufacturing remaining in the host country. An added advantage is the provision of raw materials to meet local demand with relatively simple extraction and processing technologies. A newly emerging sector is the agro-minerals industry. This involves rocks mined locally and requiring limited beneficiation which are added to the soil to improve the agricultural yield.

While not excluding other mineral commodities, initially SMI expects to concentrate its efforts on these three aspects of small-scale mining each of which require a special approach.

Small-scale mining is a neglected sector of the mineral industry. Over the last decade numerous efforts have been attempted to better document its diverse aspects. These efforts range from the UN-sponsored first international conference on small-scale mining in Jurica, Mexico, 1978, to subsequent meetings including several organized by the Association of Geoscientists for International Development (AGID). Sponsored by the IDRC in 1987, several major participants involved in these meetings met in Noamundi, India, and SMI was born. Its major objectives are to collect, collate and disseminate information on small-scale mining although it is realized that little detailed information is recorded. We are convinced, however, that some success stories covering the three major fields of small-scale mining, as mentioned above, can be



Participants at the Noamundi meeting, India, 1987

assembled which when properly recorded in a database on small mines can serve as models in different geographic, geologic, and socio-economic settings provided each case is properly analyzed.

Networking through our news bulletin, seminars and field visits and with the support of modern communication technology will be part of the strategy to realize our purpose. Recognizing the potential of Small Mining International to fill an existing information gap on small mines, with benefits to both developed and developing countries, the Mineral Exploration Research Institute (MERI), operated jointly by

Ecole Polytechnique and McGill University in Montreal, agreed to host SMI during the start-up period. The following pages report on recent activities of interest to the small-scale mining community undertaken in regions as varied as Africa, N. America and India, of interest to the small-scale mining community. We anticipate that the information we will generate will be useful to small miners, national, state, and local governments, the international mining community and agencies for bi- and multi-lateral aid. At the moment, SMI's priority is to ensure seed funding to allow a feasibility study on an information system on small mines.*

Montreal — The International Agency for Small-Scale Mining Small Mining International (SMI)

Although operational since November 15, 1988, through its secretariat at Ecole Polytechnique in Montreal, the International Agency for Small-Scale Mining was incorporated under a Canadian charter on March 31, 1989. This not-for-profit organization is managed by an international board of seventeen directors representing a varied expertise. As per its charter, SMI has an Executive Committee composed of seven representative (regional or otherwise) board members, including the officers of

the corporation. The day-to-day operations of SMI are coordinated by the secretariat which has the main responsibility to implement the recommendations of the Board of Directors. The secretariat is administered by a Managing Director.

Eventual membership will be open to a broad spectrum of producers and users of minerals, as well as to interested organizations and individuals.

The Agency's initial focus is on information services, coordination and linkage among national and international organizations working with small mines and mineral industries. In the long term it hopes to be able to provide other support services including research and training and to publish from time to time the results of technical meetings and research projects on various commodities, technologies and policies.*

The National Institute of Small Mines Creation of a body to promote the role of small-scale mining in national development and international cooperation

by S.L. Chakravorty

INTRODUCTION

Small-scale mining is one of the neglected economic sectors and yet, like small-scale industries, one with most promising employment prospects in remote rural areas. Needing very little infrastructure and very low capital investment this activity places practically no financial strain on government resources. In addition, it is responsible for a substantial percentage of non-fuel mineral production.

Small-scale mining is more prevalent in India than is usually realised. Unfortunately, there are no reliable statistics to support figures on number, production and employment, mainly because no formal definition of small-scale mining has yet been adopted. Furthermore, many small mines remain unaccounted for either because they never register or they register into different categories. Nevertheless, broad figures can be advanced. According to dependable sources the total number of small mines may exceed

8 000 providing over 500 000 jobs. The production value may represent about 20% of the total value of non-fuel minerals. Characteristically, the small mines are technologically and financially weak and most of them are privately owned. In India, the private sector accounts for about 85% of the total mines in operation. Small-scale mining doubtless represents a significant activity contributing to India's economy.

For the last decade or so, matters concerning small mines have been attracting international interest. In 1984, the Government of India organised an international workshop on Mineral Policy for Small-Scale Mining. This event was followed in early 1986 by eight regional seminars organised by the Mining, Geological and Metallurgical Institute of India (MGMI), in collaboration with the Federation of Indian Mineral Industries (FIMI), which covered small mineral deposits and small-scale mining across India. Thereafter, in response to the growing interest in this sector on the part of a wide range of private and public organizations and as a result of a special initiative taken by a few individuals, the Noamundi meeting was

held in July 1987 at which an international body on small-scale mining, later Small Mining International (SMI), was proposed.

During the proceedings it became clear that as a logical corollary to the formation of SMI it would be necessary to create national bodies in different countries all over the world to become integral parts of an international network. Such national bodies would also address particular needs and problems of their small-scale mining sector.

FORMATION OF NISM

Accordingly, as a follow-up action, a series of meetings were held in 1987 and 1988 to mobilise opinion and support in favour of the formation of India's National Institute of Small Mines (NISM). This national body is expected to be operational in April 1989 following registration under the appropriate Act.

This non-governmental organization aims, firstly, to encourage the small mining sector to use technical and scientific methods in its operations and, secondly, to raise consciousness regarding environmental protection. It is expected that these objectives will be much easier to achieve if enforced by the small mining community, represented by NISM, rather than being imposed in the form of government rules and regulations.

NISM has three categories of members. **Individual Members** are admitted mainly on the basis of training and experience. Technical, scientific or professional associations, organizations connected with mining, mineral processing or geo-science and banks and financial institutions are accepted as **Association Members**. Any firm or company engaged or interested in mining activities, mineral trade, marketing of minerals or any other related commodity or product, the manufacturing or marketing of machinery and equipment can be **Business Members**. With predominance given to Business membership and Individual membership limited to 100, it is ensured that the NISM remains truly a self-help body of the mine owners.

The formation of the National Institute of Small Mines was made possible through the help and support provided by two premier research organizations in India - one a purely scientific and technical institute of 83 years standing (MGMI) and the other mainly a techno-industrial body (FIMI). The objectives, the scope and functions of NISM are in some respects different from, but also complementary to, those of these two institutes. This trio, working together with appropriate support and understanding from the government authorities, can be a strong mechanism for developing India's mining and mineral industries.

AIMS AND OBJECTIVES

Some of the main objectives of NISM are to :

- o serve as the national forum for motivating the small mining community in its scientific progress;
- o keep abreast of continuing progress and development in science and technology concerning the small mining sector;
- o promote, at all levels, the role and contribution of small-scale mining to economic and social development;
- o collect, analyze and disseminate scientific, technical and sociological knowledge, information and data;
- o develop techniques for exploration, mining and processing and for conservation of mineral resources suitable to the small mining sector;
- o organise support-services including research and training;
- o make continuous review of legislative measures applicable to the small mining sector and suggest changes as needed;
- o coordinate and liaise with national, regional and international institutions and technical and professional bodies.

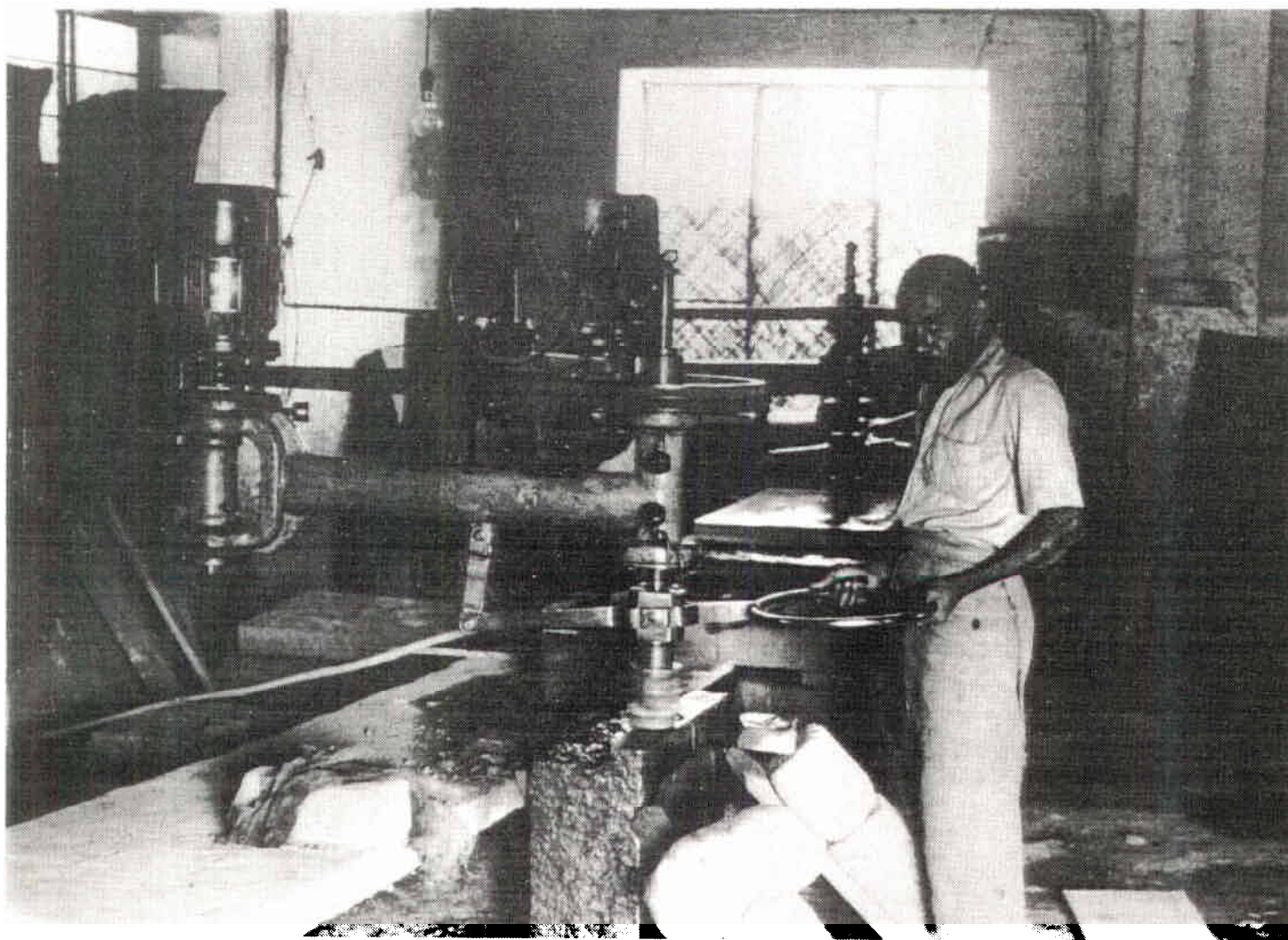
EXPECTED BENEFITS TO SMALL MINES

It is recognized that small mine owners generally do not have technical and financial capabilities for proper exploration, development, extraction and processing. They also do not have sufficient mechanical equipment and good repair and maintenance facilities. They quite often lack concern for safety, conservation and protection of the environment and are generally weak in marketing their product at a fair and remunerative price. Thus on the whole they will benefit if, through their own representative body, NISM, they are technically advised and properly guided and, where possible, actually supported by a concerted action plan.

INTERNATIONAL COOPERATION

The driving force behind the formation of NISM was the realisation that small mining operations can derive immense benefits from international experiences with respect to exploration, mining and mineral processing. Quite often small mine owners are totally unaware of the fact that many of their problems might have already been solved in other countries. The International Agency for Small-Scale Mining - Small Mining International (SMI) can act as a central body passing on such information to national bodies who, in turn, can effectively disseminate it amongst their small mining community. NISM wants to develop and maintain a close

relationship with SMI and function as its contact point in India thus becoming part of an international network for bi- and multi-lateral communication.■



Polishing Diabase with Indian-Manufactured Machine, Bangalore, India

Small-Scale Miners Association

by J. Spiropoulos

The economic potential of small scale mining has long been recognized in Zimbabwe where over 90% of operating gold mines in the country produce less than 80kg per annum.

Small scale mining activity is diverse both in terms of the range of minerals mined and the scale and level of sophistication of the mining operation. The small miners in Zimbabwe can be broadly categorized into two groups. A relatively sophisticated group with access to the range of resources available to small miners and a relatively unsophisticated one with limited resources and little knowledge of how to get access to them. This second group emerged with the opening up of the industry and economy since independence.

Over the years the Zimbabwe's Ministry of Mines has put in place a well worked-out system of technical and financial support to small miners. Furthermore, the law relating to prospecting and mining rights has very few restrictions. However, although the more sophisticated small miners make good use of what is available, the less sophisticated group, which constitutes the vast majority of miners, is not getting the benefits of the system. It is this section of the mining population which needs the greatest assistance and it is this group that the Small Scale Miners Association of Zimbabwe (SSMAZ) represents and aims to support.

The Association is a voluntary non-government organization of operating and prospective small miners. It was formed in 1982, after independence, by a group of Zimbabwean businessmen and women who in addition to their other business activities had an interest, and in many cases were actively engaged, in small-scale mining.

It was initially formed as a pressure group with the aim of attracting the attention of the newly formed government to the needs and aspirations of the African small mining community. Of late the SSMAZ has focused on performing a service function.

At the beginning of 1987 the Association received the support of the Intermediate Technology Development Group (ITDG) of the UK in the form of an advisor to initiate a number of small projects and help formulate a

policy direction for the Association. Although this assistance has already gone some way towards strengthening the Association, its technical and administrative capacities remain inadequate. In spite of this, however, it has managed to establish an extensive nationwide network of operating and would be miners.

The Association has a membership of approximately 700 operating small miners and a further 700-1 000 prospectors and would-be miners are possible candidates. The majority (around 60%) of these miners are engaged in gold mining but there are also a number involved in the mining of pegmatite minerals such as tin, tantalite, beryl and the associated precious and semi precious stones.

Characteristically, the miners form very small enterprises operated individually or jointly by small groups of between 4 and 10 local small businessmen and women. The mines are severely under-capitalized with mines operating with minimum tools and equipment. Tools used range from chisel to hammer and pinchbar for extraction, and wheelbarrows, windlasses and buckets to take the ore to the surface. The known reserves are small and therefore project life under existing exploitation methods is short. Furthermore, the environmental impact is destructive and the health and safety conditions in the mines are seriously inadequate.

A socio-economic survey conducted by Intermediate Technology Development Group has shown the mine labour to be severely dependent on the continuity and prosperity of the small mines. At the same time, due to a number of constraints, the mines are only marginally profitable, consequently, employment is erratic and insecure and the income derived from it uncertain.

In summary, the needs and problems of the small miners stem from three sources. These are a lack of financial assistance, lack of technical and managerial skills, and inadequate information.

The SSMAZ has come to recognize its shortfalls and limitations, but it is also clear as to the needs of its members and how these needs might be addressed. To this end it has adopted a number of aims and functions.

To function as an information and advisory centre.

The Association can alleviate a number of technical and financial constraints that burden the small mining population by providing advice and information to its members on existing services, including financing, available from the Ministry of Mines. These government services and facilities are often more than adequate for the needs of the miners, but many of them don't have the knowledge of what is available or how to get access to it. The Association will disseminate this information and advice through its newly established newsletter and by direct contact with its members.

To provide technical and business management training to improve the performance of its members.

In the past, a number of seminars were held which brought together small miners and representatives of the technical and legal departments of the Ministry of Mines. These seminars dealt with subjects such as mining practice, surveying, safety, rock identification and basic geological principles. The seminar program was stopped two years ago due to lack of funding but it is intended that it should be re-activated when the required money is raised.

The concept of a mobile training unit has been put to the members and has been supported enthusiastically. The training unit would comprise a qualified trainer/organiser with the necessary training materials and vehicle. This person would travel from one area of concentrated mining activities to another organizing and running short training courses based on identified training needs. The trainer would work closely with the regionally based technical staff of the Ministry of Mines. Donors for this project are presently being sought.

A training workshop was held in September 1988 in collaboration with ITDG, the British Geological Survey and the Ministry of Mines of Zimbabwe to teach small miners basic exploration techniques. It is hoped that this initiative will be followed up with a more extensive training program in this subject.

To initiate projects for the benefit of its members.

In addition to information, training and advice the Association has a strategy to take direct action to improve the effectiveness of small-scale miners. The first project in this approach is currently being implemented. It is a pilot project to test the concept of mining service centres to provide shared processing facilities which miners cannot afford individually : a drilling and blasting service, and practical mining advice and assistance. If this concept proves to be successful there is scope to establish other similar centres in other parts of the country.

To represent the interests of its members and the small mining community at all levels.

The Association has represented the small miners at the Mining Affairs Board, a policy-formulating body at the Ministry of Mines.

Budgetary constraints have severely restricted the Association's capacity to provide the services needed by its members.

But, the SSMAZ continues its efforts by operating on a shoe string. It does so because everyone involved is or has been a miner and from experience is well aware of the need for organization to be recognized.*



Flagstone Quarried for Construction Materials, Accra, Ghana

Various Definitions of Small Scale Mining Have Been Based on

- Mine output in tpy.
- Number of people employed.
- Size of concession or lease (e.g. less than 1,000 hectares for metals-Peru).
- Size of reserves (e.g. less than 1,000,000 cubic yards for a particular grade of placers).
- Productive capacity (e.g. less than 100 tons per day).
- Gross annual income (e.g. less than \$900,000-Mexico).
- Degree of capitalization of mechanization (e.g. less than \$160,000-Mexico).
- Continuity of operations (e.g. seasonal).

For further reading on this topic please consult Noetstaller, R., 1987, *Small-Scale Mining : A review of the issues*, World Bank Technical Paper No. 75, Industry and Finance Series, Vol. 23, Washington, D.C.

"Small-Scale Gold Mining for Developing Countries" An international professional development seminar

by J. Davidson

The professional development seminar "Small-Scale Gold Mining for Developing Countries" was convened at McGill University, Montreal, Canada, on April 24-28, 1989. The seminar was organized by the University's Department of Mining and Metallurgical Engineering as part of its internationally recognized professional development program series.

Participants came from Asia, Africa, the Middle East, Latin America and Europe. In all 16 countries were represented. Most participants represented government agencies or departments - mineral engineers, geologists, and economists serving in a variety of posts. Most had come to familiarize themselves with the variety of technical, economic and political issues surrounding gold mining at the small scale.

Seminar topics covered : marketing, exploration geology, ore reserve estimation, project economics and costing, mining investment codes and fiscal policy, mine financing, feasibility study requirements, mining and processing principles and technology, safety and ground support considerations, and institutional support mechanisms for small miners.

Apart from the formal presentations, questions and discussions ensued. The general consensus which emerged from the week-long seminar was that the objective of supporting and rationalizing small-scale gold mining sectors in developing countries is desirable, but that the approach and mechanisms for realizing this goal can not easily be reduced to a simple formula. The problems and the required solutions vary from place to place as a function of history, economics, politics, education and geology. Yet limited, but encouraging, successes are being achieved. What is often necessary is a strong political will to implement policies and arrangements that may be difficult and initially unpopular. As well, a major problem defined by the participants was the lack of access to information, both technical expertise and other country's experiences. Recognized was the critical need for some organization to act as a clearing house and repository for small-scale mining information and experiences."

FOLLOWING IS THE TEXT OF
THE INTRODUCTORY REMARKS
MADE BY MR. J. DAVIDSON,
CO-ORGANIZER OF THE SEMI-
NAR

An Economic Activity With a History

Small-scale mining is an ancient activity, dating back to pre-classical times. With the dawning of the industrial age came an increased demand for minerals and the wherewithal to extract and process them more systematically. Even as mines in the industrializing world grew larger, substituting capital machinery for animal and human labour, and employing increasingly sophisticated technology to all of the various unit mining and milling operations; a small mining sector continued to exist, although contributing a diminishing portion of mineral production to total world output.

More recently, an acceleration of technological development, and increasing levels of capitalization and equipment scale-up, have allowed access to large, low grade mineral deposits, previously uneconomic to mine or process. The export of this approach to developing countries changed the nature and image and mining enterprise worldwide. Even the way in which mines were financed, changed from equity funding to project debt financing to reflect the increasing capital requirements. This trend to the large scale also meant larger absolute profits, but at the price of increased lead development time, decreased flexibility to respond to market vagaries and increased vulnerability to world economic forces.

In developing countries, large externally funded and owned operations often displaced very small scale artisanal activity, while domestic capital and entrepreneurship remained limited to low tech, small-scale quarrying or dredging operations. Most recently, the competition between large mining companies and peasant miners for a piece of the gold action has intensified, e.g. Mt.Kare, Papua New-Guinea; Lebong Tandai, Indonesia. Small miners are often regarded as a thorn in the side of rationalized, corporate mining activity, but there is little doubt that small gold mines are still of significant economic importance to

many countries.

It has been suggested that small mines (< 100 000 tpy) account for 10% of the value of world gold output. In most developing countries, the share is greater. In Brazil, for example, the garimpeiros are alleged to produce annually 85% of the country's total new gold.

The net benefits to be derived from gold mining activity may be greater from small-scale operations than from large mines. Certainly, production technology associated with small mines is often better suited to the developing country's relative factor scarcities. This translated into more employment per unit production and more absolute employment in many situations. It often means greater local income generation, a smaller drain of the balance of payments and more backward linkages into the local economy. The capacity of larger mines, often owned by external interests, to contribute to national income is limited by their profit requirements and the high import content of their depreciable expenditures. Since their product is sold abroad, the forward linkages are minimized. Large mines often operate as "economic enclaves", making only modest contributions to the development of the local economy, with their major contribution to economic occurring in the form of tax receipts and foreign exchange.

Economic Organization of Small-Scale Mining

So what do we mean by small-scale mining, as a form of business organization? With respect to domestic capital and entrepreneurship, three categories can be defined : (1) artisanal mining, of a legal or illegal character, represented by individual, families, and groups of locals, (2) co-operatives represented by partnerships of several or more workers who are part owners and share in the profits, (3) open pit and underground small mines which are legally constituted, may be partly mechanized, operated with limited technical expertise, and usually employ contract or wage labour.

These forms of organization are to be distinguished from the small, mechanized mining occurring in industrialized countries. Such "small" mines

are at the high production end of what defines a small mine in developing countries, and they operate within a completely different technological framework. This is not to say that there is no place for such operations in developing countries; in fact there are many analysts who would argue that it is the only way to go - but the trade-offs between production efficiency and economic welfare must be clearly understood and accepted.

Some Advantages and Disadvantages of Domestic Small-Scale Mining

Whichever form of organization we feel inclined to promote, we should be aware of its strengths and weaknesses. In the case of domestically operated small mines, their advantages reflect the fact that they,

- o can operate in remote areas with modest or no infrastructural support;
- o allow for exploitation of what may otherwise be economically unexploitable deposits on the larger or

more mechanized scale;

- o require little capital and little lead time to bring into production;
- o are better able to respond to market vagaries, given lower overhead burdens;
- o are more easily integrated into the existing social system;
- o create employment and generate income in rural areas;
- o require fewer imported inputs;
- o local ownership means net gain to the national economy (income generation and foreign exchange retention) is potentially greater than from large scale activity.

The local forms of small-scale mining have also been seriously questioned and criticized as being,

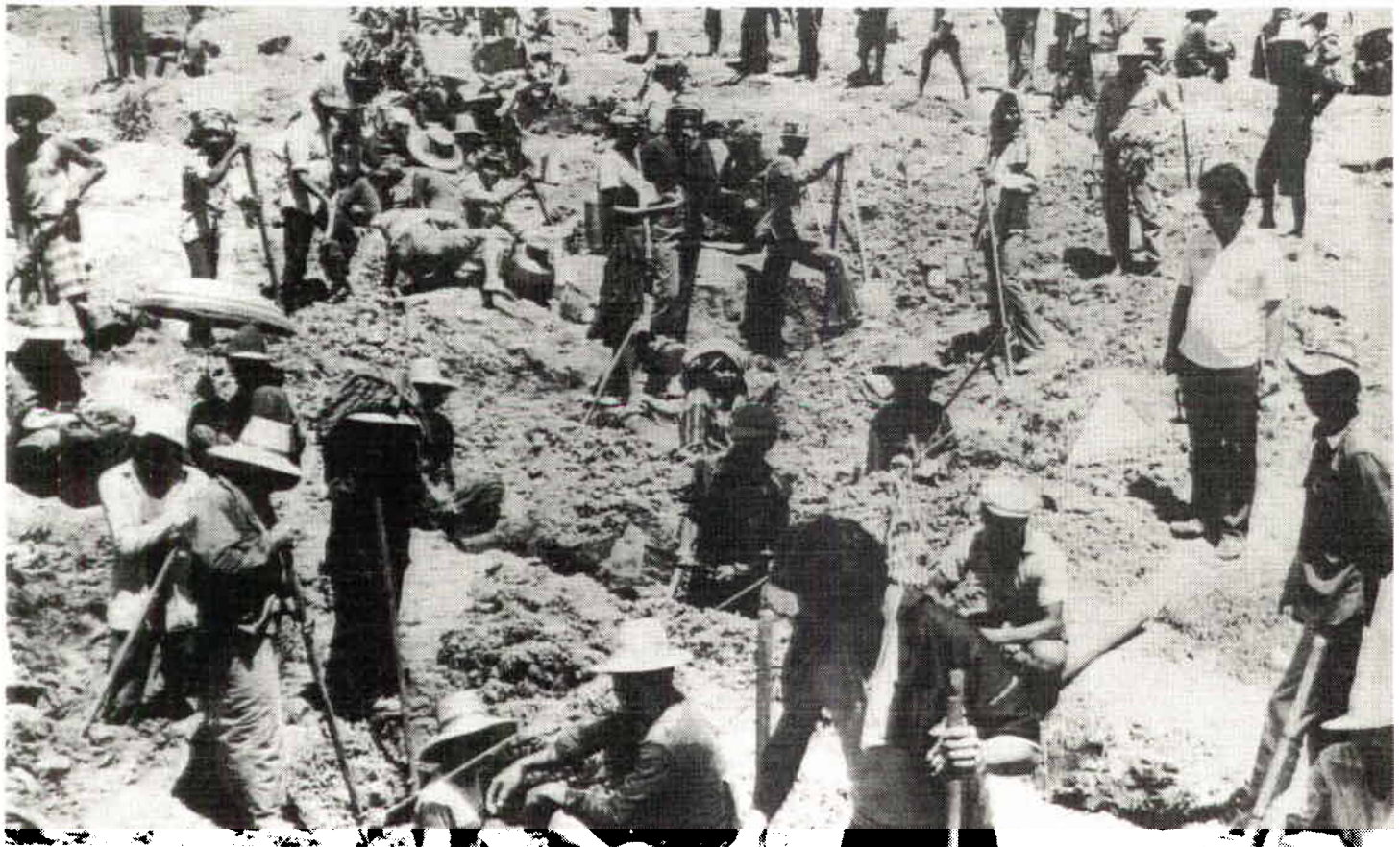
- o inefficient and wasteful, involving loss of resources through use of poor recovery

techniques, through highgrading and/or fractionation of workings that could ruin a larger deposit capable of accommodating more mechanized mining methods;

- o unsafe and harsh working conditions;
- o conducive to the creation of larger scale environmental problems, including destruction of farmland, river bank erosion and silting, mercury contamination;
- o difficult to regularize, record and keep track of;
- o prone to illegal activity (mining and marketing), leading to loss of an important foreign exchange potential.

Some Questions That Remain To Be Answered

What kind of gold mining industry is desired? What mixture of foreign and local involvement should be promoted, what technological mix? How can the industry best be supported to achieve



Gold Rush Near Kabinburi, Thailand, 1981

the desired configuration? How can the benefits of a gold mining industry be optimized, taking into account the often time divergent interests of foreign investors and mining companies, national governments, and local communities and artisanal miners? How can a complementary and cooperative relationship between small-scale entrepreneurs and large business organizations be fashioned and maintained?

This seminar will attempt to grapple with the larger questions, by addressing in various ways and at various moments, many of the smaller problems and issues that comprise and complicate the whole picture, including :

- o the differing historical experiences of countries with mining activity at both the large and small scale and its implications for the kinds of support and training mechanisms required;
- o the social and economic impacts of a "gold rush" on local communities and the implications of a "gold

rush" mentality for rational and efficient resource extraction;

- o the role and function of the local middlemen in domestic and international gold transactions, and their relationship to the parallel market;
- o the conditions surrounding the growth and development of a parallel market and the opportunities it may provide for regularization;
- o the predisposition of national governments to deal with large centralized organizations rather than small, dispersed local groups;
- o the elements of fiscal and legal codes that can either promote or discourage certain kinds of activity within the sector, including foreign exchange retention and the development of forward and/or backward linkages;
- o the balancing of foreign in

vestment opportunities with the needs and interests of local communities;

- o the myriad technical issues, e.g. appropriate gold extraction targets and economic evaluation methods, reserve estimation, mining and processing recovery techniques, technology transfer and adaptation and environmental damage.

When we ask you to evaluate the worth of the seminar at week's end, we ask that we be judged, not by our success or failure in resolving all of these outstanding issues, but rather by our ability to stimulate some new thinking on your part; to go part way in addressing your own information needs; and finally to promote the sharing of experience and the lessons that have been learned among both participants and presenters. •

NEWS BRIEFS

Ghana's "Galamsey" Goes Legal

Until this year, small-scale mining, known as "galamsey" was illegal in Ghana. In order to share in the enormous benefits, estimated at \$30 million in 1985, lost to gold and diamond smugglers, Ghana's Minerals Commission and Mackay and Schnellmann of London conducted a study into regulating small-scale mining. As of April 1989, any Ghanaian wishing to carry out small-scale gold and diamond mining can do so by applying to the Minerals Commission for a 3-year, renewable, licence. As a further incentive all small miners are exempted from taxes and royalties for the first three years of operation. The Precious Minerals Marketing Corporation, which ensures that a world market price is paid for the commodities, has become the central buying facility for gold and diamond from small miners. Finally, eight district centres were set up throughout Ghana to train small miners on safety, efficient gold recovery and environmental issues.

(West Africa, May, 1989)

Malaysia drafts resolution on small-scale mining to UN

On March 27-April 5, 1989, the Mineral Resources Branch of the UN Department of Technical Co-operation for Development presented a position paper entitled "Small-Scale Mining Prospects in Developing Countries" at the 11th session of the Committee on Natural Resources. Of particular interest is the emphasis put by the UNCTD on "international and inter-country co-operation in the exchange of information and experience, and support of national efforts through provision of expertise, financing, markets and technology".

In response to this meeting, Malaysia presented a draft resolution requesting the UN's Secretary-General to continue to conduct studies on prospects for small-scale mining, to evaluate the experience gained through technical co-operation endeavours and to explore ways and means of strengthening technical co-operation and possible sources of financing for small-scale mining initiatives.

The resolution also asks that the Secretary-General ensures the assistance of the United Nations system in providing adequate facilities for seminars and symposiums, to promote local dissemination of information on the issue of small-scale mining and to establish policies and programmes according to the priorities of Member States for the support and promotions of small-scale mining projects.

CIDA funded project in Nigeria

A 4-year, \$1.4 million project co-sponsored by CIDA, McGill University (Montreal, Canada) and Ahmadu Bello University (Zaira, Nigeria) is scheduled to begin in mid-1989. The project will involve analyses and improvement of indigenous mineral-based building materials for use in low cost housing construction. Most importantly the goal of the program is to strengthen ABU staff's ability to react to future housing/building materials problems by providing training, teaching and research facilities.

BOOK REVIEW

Stone: An Introduction

by Asher Shadmon

Intermediate Technology Publications, London, 140p, 1989

Available for \$15.95 US from The Bootstrap Press, 777 United Nations Plaza, New York, NY 10017, U.S.A., or for 9.95 pounds sterling from Intermediate Technology Publications, 103-105 Southampton Row, London WC1B 4HH, U.K.

Most geologists and mining engineers are introduced to the use of stone early in their studies, as they are led around the campus or city streets nearby to be shown the use of dimension stone on building facades or in curbstones. Indeed, for those trained far from the nearest outcrop, this may be the only contact with rocks out-of-doors! For most of us, that is the end of our professional contact with the stone industry. A remedy for this situation has now been provided by Dr. Shadmon, one of the foremost experts on stone today, in this succinct introduction to what must surely be the oldest application of earth materials to human activity, one that still employs many tens of thousands of workers and that still provides the basis for a lucrative trade, much of it on a small scale.

Shadmon outlines here the properties of stone materials, their sources, methods of extraction, tools for stoneworking, use in construction, and modern processes of industrial production. The many photographs and line drawings, from operations in many parts of the world, illustrate clearly the many facets of stone technology in a manner so simple and direct that this slim volume can be regarded as a do-it-yourself manual. Of course, there are many specialized terms to be explained, such as "scutch," "peen hammer," and "drove" (all hand tools for working stone), but with the exception of contemporary machines for flame-jet and water-jet cutting, most of the technologies involved are simple and straightforward.

Many of the author's experiences have come from his involvement in UN projects aimed at starting stone industries in developing countries where scant use has been made in modern times of local stone materials for building and where scarce foreign exchange has been spent on the importation of cementitious materials from abroad. As a result he is very well aware of the financial, policy and planning factors that are necessary in order to start a successful new industry, and a final section of the book discusses briefly the basic requirements for starting a stone industry. For those interested in the use of rock in construction, or in the management of small-scale enterprises, this book should prove invaluable.

- A.R. Berger, Ottawa, May, 1989.

PUBLICATIONS

Small Mines Development in Precious Metals edited by Ta M. Li and T. M. Plouf, 261p, 1987. Available from the Society of Mining Engineers, Littleton Colorado for US\$43.50.

The Profitable Small Mine : Prospecting to Operation edited by Koehler S. Stout, 174p, 1984. Available from the Mining Information Service, McGraw-Hill, New York.

Strategies for Small-Scale Mining and Mineral Industries, Report of a national workshop held in Mombasa, Kenya, April 14-25, 1980, edited by James M. Neilson, AGID Report No. 8, 199p, 1982. Available from the AGID Headquarters c/o AIT, P.O. Box 2754, Bangkok 10501, Thailand.

Still available from Maclean Hunter Publishing Company, Mining Information Services, P.O. Box 6500, Chicago, IL 60680, USA, for US\$15, **The Future of Small-Scale Mining** edited by R.F. Meyer and J.S. Carman, UNITAR, 495p, 1980.

CALENDAR OF EVENTS

September 25 to 28, 1989. MINING LATIN AMERICA Conference and Exhibition, Rio de Janeiro, Brazil. Contact IMM, 44 Portland Place, London W1N 4BR, UK.

October 22 to 25, 1989. WORLD GOLD '89, forum on gold technology and practices, Bally's Hotel, Reno, Nevada. Contact Meetings Dept.- World Gold '89, Society of Mining Engineers, PO Box 625002, Littleton Co 80162, USA.

November 13 to 15, 1989. MINERAL EXPLORATION PROGRAMMES International Symposium (MEP '89), Palacio de Congresos, Madrid, Spain. Contact International Mining, 4 Brandon Road, London N7 9TR, England.

March 1990. FIFTH TRIPARTITE TECHNICAL MEETING FOR MINES OTHER THAN COAL MINES on labour and social issues in this sector, Geneva, Switzerland. Contact the Sectoral Activities Department, International Labour Office, CH-1211, Geneva 22, Switzerland.

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SMI is a non-profit organization dedicated to strengthening and supporting the small mining sector as an aide to rural development, social and economic, especially, but not exclusively, in developing countries.

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Contributions in English, French, and Spanish on all aspects relating to small-scale mining, including upcoming events and new publications, as well as, comments and suggestions are welcome.

Requests for information on membership and subscription requirements can be addressed to SMI's Managing Director at the above address.
