Geological Society of Zimbabwe
1960 -2010

Newsletter

October 2010

ZGS - 100

The lava lake of Nyiragongo, 3500 m, is about 200 m in diameter and some 800 m down in this active cone, the southernmost volcanic peak in the Virunga National Park north of Lake Kivu, DRC. Photo by Xavier Marchal, 2010

THE GEOLOGICAL SOCIETY OF ZIMBABWE, P.O. BOX CY 1719, CAUSEWAY, HARARE

Contents

The Committee, on behalf of the Geological Society of Zimbabwe, would like to offer a sincere vote of thanks to Marion de Beer of *Cadline* for preparing and printing our Phaup Award certificates for 2009 -- free of charge. This is, as previously, a wonderful gesture of Marion's time and skills and we can only encourage all you geologists and mining houses to steer your Autocad mapping work in her direction and to take advantage of at least 30 years of hard-won cartographic experience. *Cadline* also offers monochrome printing and scanning services in formats up to A0. Their telephone contact is 04-2917261/60 Tel/Fax is 04-301855 and the address is 94B Pendennis Road, Mount Pleasant in Harare. marion.debeer@cadline.co.zw

Editorial

The Society's Symposium commemorating a 100 years of achievement of the Geological Survey Department follows hard on your receipt of this Newsletter, the second under the Chairmanship of Daniel Chatora. The Committee and the Symposium Sub-Committee under the guidance of Andrew du Toit have worked hard to get the show on the road. With up to 70 attendees from Germany, the UK, South Africa and elsewhere in the region, as well as from our home turf, we look forward to a stimulating discourse amongst people who share a common interest, often a passion, for progress in Zimbabwe and at the Geological Survey in particular. More often than not they share a vibrant history of an institution that must continue to follow its principles of service to both country and its people. We are looking forward to our Symposium, the stimulation that it and the associated field trips will bring, and the encouragement that the delegates will exude for the Survey, in particular, to face the next century of its well being.

In this issue Forbes Mugumbate writes about the past, present and future of the Geological Survey and a list of the geological staff members who served the Department over the past 100 years is appended to record their part in the history that they have made. The undersigned gave an illustrated presentation to an audience in excess of 100 at a meeting of the History Society on 9th September in order to bring home to a wider spectrum of the community, the achievements of a small but dedicated department.

Andrew du Toit and Allan Wilson attended the 11th International Platinum Symposium in Sudbury, Canada in June, and we are privileged to present their extended abstract relating to their ongoing understanding of the MSZ and variables that are making themselves evident with respect to mineralization. We thank our regular contributors for their news columns, and hope that you the reader find the following pages of interest.

Tim Broderick

Chairman's Chat

Daniel Chatora

I will start by paying tribute to a member of the Geological Society of Zimbabwe who made history in May this year. Ellah Muchemwa became the first woman to be welcomed into the executive of the Chamber of Mines of Zimbabwe when she was elected its Second Vice President at the 71st Chamber of Mines AGM. I am sure all members of the Society join me in congratulating Ellah for her achievement.

The Society's congratulations also go to another Member, Vimbai Chakanetsa, for being named The Zimbabwe Institute of Management Private Sector Manager of the Year. Well done guys, our Society is proud to be associated with you

It's now less than a month to the Geological Survey of Zimbabwe Centenary celebrations Symposium and Field Trip to be held starting in Harare from the 20th to the 25th of October. The subcommittee organizing this "Event of the Year" is reporting considerable progress and is sending out a 3rd Circular with all the information on registration fees, accommodation and travel arrangements. This circular is published in this newsletter as well. One of the highlights of the Symposium will be the esteemed Alex du Toit Memorial Lecture to be presented by Professor Terrence McCarthy on the afternoon of 22nd October.

Although 8 Special Grants for coal exploration have been granted by the MAB this year, with reports of drilling having commenced on at least two of them, the same cannot be said for EPO approvals. No EPOs have been granted for the past 9 years. This means that as far as exploration is concerned, we remain stagnant. The only exploration that is taking place is on operating properties looking at replacement or the expansion of their resources. Most of it is reported in platinum, gold and chrome.

On Society talks we had a world-class presentation on Kimberlite Exploration in the DRC by Zee Bhebhe on 16th June. With the aid of slides depicting his experiences in the Congo, Zee's presentation, to an audience of 15, showed that Zimbabwe-trained earth scientists are making significant contributions in realm of exploration for economic minerals.

We look forward to seeing you all at the Geological Survey Centenary Celebrations Symposium in October, when we should also recognize 50 years of our own Geological Society activity as the inaugural meeting of the Geological Society of South Africa (Rhodesia Branch) was chaired by J.C. Ferguson on 27th June 1960.

Articles and Reports

The Zimbabwe Geological Survey
Celebrating 100 Years of Communication with the Earth's Crust

Forbes Mugumbate
Deputy Director, Zimbabwe Geological Survey

Introduction

Every country is the guardian of a unique part of the earth's crust, the foundation on which development is constructed. The composition of the crust reflects a country's mineral, energy and ground water resources. The crust also governs the incidence of natural geo-hazards such as landslides, rockfalls, sinkholes, volcanoes and earthquakes. Data that contribute to the knowledge of these attributes comprise the national geosciences database of which Geological Surveys are the custodians. Geological Surveys compile geoscientific information of the crust through the systematic geological mapping of rock formations and general cataloguing and description of mineral resources. It is for these reasons that most countries have Geological Surveys.

In Zimbabwe, the Geological Survey was established in 1910. This year, 2010, marks 100 years of establishment of this organization that has played a critical role especially in the development of the mining industry. It is therefore befitting that such a significant

milestone in the history of this important organization be celebrated. The Geological Society of Zimbabwe is organising an international geological conference and field trips to celebrate this landmark. The dates for the conference and field trips have been set for 20 to 25 October 2010. The efforts of the Geological Society of Zimbabwe are gratefully acknowledged.

This article that chronicles the role, history and aspirations of the Geological Survey has been compiled to contribute to the centennial celebrations.

History

The Geological Survey came into existence in 1910 in Bulawayo, the first director being H.B. Maufe, after whom the building currently housing the Department in Harare is named. It was established in response to vigorous campaigning by the Chamber of Mines after realizing that a tremendous amount of technical information from mines opened after the occupation of the country by the BSAC in 1890 was being lost, and as a service to the mining public. The Geological Survey became a Government Department in 1924 after Responsible Government was introduced, but continued to get funding from the BSAC until Government purchased the mineral rights in 1933. A strong leaning towards economic and mining geology has always been a feature of the Geological Survey activities.

Before the establishment of the Geological Survey, the seat of geological knowledge was Bulawayo, where the first geological map of Matabeleland was published in 1897 by R.A Fletcher and W.M. Espin. A considerable amount of geological work was carried out , chiefly by F.P. Mennell who was then the Curator of the Bulawayo Museum. The Geological Survey was moved to Harare in 1918 amid protests from Bulawayo civic organizations.

To have an appreciation of the mineral potential of the country and distribution of various rock formations, the Geological Survey immediately embarked on regional mapping of the country, starting with areas known to host important economic minerals. The mapping was carried out initially by constructing ones own base map using surveyed farm beacons and form lines and later using 1:50 000-scale topographic sheets of the Surveyor-General, but the geological maps were published on a scale of 1:100 000. Each area was mapped in detail with a geological map accompanying a Bulletin or Short Report describing the geology of the area and the mines and mineral deposits within it. The bulletins and maps produced over the years are recognized internationally as top quality and highly informative. Over 100 Bulletins and over 50 Short Reports have been published since 1910.

Synthesis of geological information gathered from mapping led to publication of the first general geological map of the country at a scale of 1:1 000 000 in 1921. As more information became available through concerted mapping efforts, revised editions were respectively published in 1928, 1936, 1946, 1961, 1971, and 1977. The first post-Independence geological map of Zimbabwe is being compiled and digitized for possible publication in 2010 to encapsulate 100 years of excellent geological work.

Some of the early activities of the Geological Survey include free mineralogical determinations of mineral specimens and chemical analyses of ores and mineral

concentrates for the public. These activities proved to be most popular with prospectors, and led to the development of many mineral prospects, notably the 1960's nickel boom. .

Activities of the Department expanded with the establishment of regional offices to allow effective visits to individual mine properties and to offer advice with regard to mine development. During the early years of its history, the organization collected plans and information on abandoned mines, which resulted in the creation of a wealth of information about most properties.

With the coming of Independence in 1980 enormous interest was shown in the mining potential of Zimbabwe by mining companies from many parts of the world and by overseas governments offering bilateral technical co-operation projects. A number of technical co-operation agreements to undertake geological work in Zimbabwe were concluded. These saw expansion of geological work and provision of equipment to the Department, as well as the training of geoscientists and technicians. Some of the organizations that worked with the Zimbabwe Geological Survey include the German Federal Geological Survey (BGR), British Geological Survey (BGS), French Geological Survey (BRGM), Canadian International Co-operation Agency (CIDA), Japan International Co-operation Agency (JICA), Australian Government and North Korean Government. These projects saw a huge generation of geological information including regional maps and bulletins, the aeromagnetic coverage of much of the country, continuance of the national gravity coverage over many parts of the country, and systematic geochemical surveying in certain areas. Technical co-operation by these foreign organizations also led to the general improvement of the administrative functions in the Geological Survey.

Despite the positive developments brought about by the technical co-operative projects, the 1990s saw a serious erosion of staff and the beginning of a decline in the activities of the Department. Few locally trained geologists stayed long, and essential services had to be provided by a few experienced expatriate staff. This compounded by the gradual withdrawal of co-operative technical aid, and the economic challenges faced by the country, led to a serious deterioration in the functionality of the Geological Survey. Field mapping ceased with resignation of all geologists in the Field Section, while the Regional Offices in Gweru and Bulawayo were closed down. The gap left by technical co-operation organizations has not been compensated by an increase in funding from the normal Government budget. The Department's key functions have been severely affected as a result.

The technical capacity that had been installed at the Department has deteriorated as financing has become a problem, and all equipment has aged.

Despite a myriad of current challenges, the Department, with its depleted staff, resolutely continues to operate with great diligence, drawing inspiration on the accumulated work of generations of great geologists that passed through this organization, and individuals work with determination for the return of good old times. Tribute is paid to various geoscientists and supporting staff who contributed at various times during the 100 years of the existence of the Department under the leadership of the following directors:

• **Name of Director**	• **Period of leadership**
• Maufe H.B	• 1910 - 1934
• Lightfoot, Major B.A.	• 1934 - 1946
• Macgregor, Dr A.M.	• 1946 - 1948
• Ferguson, J.C.	• 1948 - 1960
• Amm, Dr F.L.	• 1960 - 1962
• Phaup, Dr A.E.	• 1962 - 1967
• Wiles, Dr J.W.	• 1967 - 1976
• Stagman, Dr J.G.	• 1976 - 1978
• Morrison, E.R.	• 1978 - 1989
• Baglow, N. (Acting)	• 1990
• Orpen, Dr J.L.	• 1990 - 1993
• Ncube, S.M.N.	• 1993 - 1995
• Magalela, W.	• 1996 - 1997
• Mugumbate, F. (Acting)	• 1997 – 2002
• Hawadi, M.T.	• 2003 -

Achievements

Geological Mapping
Since its inception in 1910, the Geological Survey has been engaged in various activities that have generated a wealth of geoscientific data. A strong leaning towards economic and mining geology has been a feature of the Geological Survey. Maps embodying the results of geological work were published accompanied by explanatory text in the form of Bulletins and Short Reports. About 60% of the country is covered by detailed geological mapping.

Technical Reports on individual mineral deposits
Since early days, the geologists in regional offices have acted as consulting geologists for many miners. An important outcome of the activities of these geologists is the generation of an archive of technical reports on individual mineral deposits and occurrences. These form important references on the country's mineral potential. Over 20 000 technical reports, some of them with accompanying maps and diagrams on individual mines, mineral occurrences and mineral deposits have been compiled over a period of 100 years. The reports are filed systematically in the A.E. Phaup Library and in regional offices.

Mineral Resources Series and maps
To make various data sets more user-friendly and easily accessible, the Geological Survey often synthesizes some of the information into mineral resources bulletins and maps, popularly referred as Mineral Resources Series. These give details of occurrences and analyse the potential of selected mineral groups. The most popular publications are those relating to Gold Deposits, Base Mineral and Industrial Mineral deposits, each being accompanied by a 1:1 000 000-scale map.

Coal Resources information
Sedimentological studies of the Karoo basins culminated in the synthesis of scattered information on Zimbabwe's coal resources and potential. These publications are proving

to be most popular following the unprecedented demand for coal for power generation and the beneficiation of coking coal for metallurgical processes.

Exclusive Prospecting Order (EPO) Bulletins

With its mandate of advising the Mining Affairs Board on matters concerning mineral exploration in the country through Exclusive Prospecting Orders (EPOs), the Geological Survey has accumulated an archive of hundreds of EPO final reports. As the reports contain details including exploration methods and the techniques used, the minerals sought, and results obtained, they are a source of valuable information for both large companies and individual prospectors. There are over 1000 such reports. Of these, the results of 900 have been summarised in five bulletins to make the information easily accessible.

Computer based data management and digital cartography

In an effort to modernize, the Geological Survey has acquired technology and know how in the capture and management of digital information. With this capability, the Department is now able to create and populate databases to manage geoscientific information and to up date mineral resources databases. It is also now possible to generate thematic documents and maps and to reproduce out-of-print documents from scanned images.

Library and Museum

The Geological Survey runs the A.E. Phaup Library, which does not only provide a valuable information service on geological and mining matters from its vast collection of published and unpublished materials, but also holds several hundred books and international scientific periodicals.

In addition to the Library, the Geological Survey maintains the Macgregor Museum with a variety of rock and mineral samples for the public to view. The museum is not only important for those who may want to learn about the geology of Zimbabwe, but it provides invaluable learning materials for prospectors who may want to gain experience in mineral and rock identifications.

Challenges

Finance

During the first decade of Independence, a major portion of the Geological Survey's budget came from bilateral technical projects that capacitated the Department in terms of field vehicles, the printing of maps and bulletins, computerization and technical equipment. The gap left as these projects have been concluded has not been filled by an increase in funding from the normal Government budget. As a result, the Department is no longer able to efficiently service, maintain and replace aging equipment; buy field vehicles; publish results of field work and research; or buy books and periodicals for the library.

Professional Manpower

Like other government departments, the Department suffers from high staff turn-over. It has proved to be difficult to recruit suitably qualified and experienced geoscientists as a result of the unfavourable working conditions prevailing in Government.

Publicising information
The foundation of geological work is that of gathering of data in the field, and publishing it to make it readily and easily available. As a result of shortages in funds and the non-availability of experienced staff to edit scientific work, the Department has not been able to produce maps and bulletins and, as a result, there is a large backlog of unpublished material. The last major publication work was conducted between 1998 and 2002 when eight bulletins were printed under funding from a Germany non-governmental organization.

Generation of new geoscientic information
The Geological Survey is gradually losing capacity to generate new information. There have been no field mapping projects since 2000. In addition the Department finds it difficult to visit, verify and describe the new mineral discoveries, by both legal and illegal prospectors, that are frequently reported.

The Future

Activities of the Geological Survey during the 100 years have been biased towards the generation of information that promotes development in the mining industry. As the mining industry remains important to economic development of this country, it is the Department's desire to revive and enhance all established functions related to the generation of information for that may promote the country's mineral potential. About 40% of the country remains unmapped, whilst several of those areas that are covered may need to be re-mapped using modern techniques and interpretation in the light of developing ideas. Also the mineral resources database needs to be continuously up-dated.

While functions of the Zimbabwe Geological Survey have remained static, similar organizations in neighbouring countries have modernised to encompass all aspects of the geosphere, including geochemical mapping for environmental management and health monitoring, environmental geological mapping of urban areas, geo-hazard studies especially in karstic and mountainous areas, hydrogeological studies, geo-tourism studies etc. It is the wish of the Department to be involved in all aspects of earth resource developmental programmes including civil engineering, construction, re-settlement, water resources management, etc. These functions of modern geological surveys are important in the modern world and hence the Zimbabwe Geological Survey should modernise.

The Department will continue to campaign for recognition of its importance in the national economic development by attracting an increase in funding from Government. Potential for the funding of projects through Private-Public Sector Partnerships (PPPs) will be pursued. Also as the political and economic situation in the country improves, the Department will re-engage traditional bilateral technical co-operation partners for joint projects that involve training, especially through exchange programmes. The Department will also form new relationships with Geological Surveys from Eastern countries taking advantage of the Government's Look East Policy.

ZIMBABWE GEOLOGICAL SURVEY

SERVING GEOLOGICAL STAFF 1910 - 2010

Compiled by T.J. Broderick
& updated by staff at the Geological Survey, 2010

AIT-KACI AHMED, Dr A.	Senior Geologist 1996 - 2002; Chief Field Geologist 2002-2004
AMM, Dr F.L. (d)	Geologist 1933 - 1960; Director 1960 - 1962 (to Director Mines)
ANDERSON, C.B. (d)	Mineralogist 1966 - 1969; Geologist 1969 - 1978; Economic Geologist 1978 - 1986; Deputy Director 1986 - 1988
ANDERSON, S.M. (ne'e WARNER)	Mineralogist 1969 - 1972; Rejoined temporarily 1975 -1976; 1976 - 1980
ARMSTRONG, Dr M.	Editor (BGS/ODA) 1990 - 1993
ARNETT, O.J.L.	Assistant Regional Geologist Salisbury 1968 - 1976; Regional Geologist Bulawayo 1976 - 1978
BACHE, J.J.	Project Leader /Geologist (BRGM) 1982 - 1984
BAGLOW, N.	Geologist 1981 - 1988; Chief Field Geologist 1988 – 1990; Acting Deputy Director 1988 - 1989; Acting Director 1990
BALDOCK, Dr J.	Project Leader/Geologist (BGS/ODA) 1982 - 1986
BARBER, Dr B.	Coal Geologist/Assistant Economic Geologist 1983 - 1990
BARKER, M.C.	Assistant Regional Geologist Bulawayo 1972 - 1975
BARLOW, N.E. (d)	Mineralogist 1930 - 1956
BARTHOLOMEW, Dr D.S.	Geologist/Assistant Economic Geologist 1984 - 1990
BARTON, Dr C.	Geologist (BGS/ODA) 1982 – 1986
BICHARD, H.T. (d)	Editor/Assistant Editor 1986 – 1987
BIRD, J.	Geophysical Technician 1976 - 1977
BLISS, N.W.	Geologist 1959 - 1967; Regional Geologist Gatooma 1967 - 1968; Economic Geologist 1968 - 1969
BOTH, F.	Geologist (CIM) 1989 - 1991
BOUAMMAR, Dr N.E.H.	Senior Geologist 1996 - 2002
BRASSEY, J.M.	Geologist 1948 – 1950
BRISLIN, B.V.	Geophysical Technician 1975 - 1976
BRODERICK, T.J.	Geologist 1972 - 1980; Chief Field Geologist 1980 – 1988; Acting Deputy Director 1988
BWERINOFA, O.K. (d)	co-Deputy Director 1980; Deputy Director 1981 - 1982
CAMPBELL, Dr S.D.G.	Geologist (BGS/ODA) 1989 - 1993
CARNEY, Dr J.	Geologist (BGS/ODA) 1983 - 1986
CHARUMBIRA, A.	Geophysicist 2006
CHATORA, D.	Assistant/Acting Regional Geologist Harare 1986 - 1988
CHENJERAI, Dr K.G.	Geologist 1986 - 1989; Regional Geologist Harare 1989 – 1993
CHERRY, D.W.	Geologist 1949 - 1953
CHESHIRE, P.E.	Geologist 1976 - 1979
CHIGUMBU, T.	Geological Technician 2008
CHIHOTA, O.	Geologist 1992 - 1994
CHIMBODZA, P.	Assistant Regional Geologist Gweru 1987 - 1990
CHINGOMBE, T.	Geophysicist 2006 - 2007
CHITUMBA, J.	Geophysical Technician 1988
CHIYANIKE, T. (d)	Geologist 1987 - 1990
CHOE, G.H.	Geologist (North Korea) 1982 - 1983
CHOE, M.G.	Geologist (North Korea) 1982 - 1983
CHUNNETT, I.E.	Geologist 1969 - 1972
CLAY, A.N.	Geologist 1977 - 1979
CROW, Dr M.J.	Geologist (BGS/ODA) 1982 - 1986

DALLAS, Dr S.	Geologist (BRGM) 1982 - 1984
DAVIES, B.J.	Geophysicist 1982
DLADLA, Ms N.	Geophysicist 1990 –
DOBELL, F.O.S. (d)	Geologist 1936 - 1939
DUBE, Ms C.	Geophysical Technician 1991 - 2002
DUBE, C.	Mine Geologist Bulawayo 1993
DUBE, W.	Economic Geologist 1998 -2003; Acting Regional Geologist Bulawayo 2003 -
DUKE, C.W.	Assistant Regional Geologist Harare 1980 - 1981; Regional Geologist Gweru/Harare 1982 – 1985 (to Deputy Minister of Mines)
DUNKLEY, Dr P.N.	Geochemist (BGS/ODA) 1984 - 1986
DU TOIT, A.J.	Geologist 1987 - 1989
EDWARDS, D.	Geologist 1969 - 1974
FERGUSON, J.C. (d)	Geologist 1930 - 1948; Director 1948 - 1960
FERNANDES, Dr T.R.C.	Mineralogist 1973 - 1975
FEY, P.	Geologist 1971 - 1976;Regional Geologist Salisbury1976 - 1980; Chief Field Geologist (ASAS) 1992 - 1995
FISK, K.P.	Senior Geophysicist (CIDA) 1994 - 1997
FLINT, R. B.	Principal Geologist (ASAS) 1992 - 1995
FOUNTAIN, A.	Geologist 1980 - 1983
GARANDE, J. (ne'e MUCHENJE)	Geologist 1987 - 1995; Acting Chief Economic Geologist 1995 - 1996
GARSON, Dr M.S.	Geologist (BGS/ODA) 1983 - 1986; Editor (UNDP) 1986 - 1988
GARVIE, O.G.	Geologist 1970 - 1972
GILLICK, R.	Geophysicist (CIDA) 1985 - 1987
GOLDBERG, Dr I. (d)	Geologist 1959 - 1966; Regional Geologist Bulawayo 1966
GOROMONZI, Mrs I.	Mineralogist 1981 - 1997; Acting Chief Economic Geologist 2002 - 2007
GOSCOMBE, Dr B.D.	Geologist (ASAS) 1992 - 1994
GRANT, D.E.	Geologist 1976 - 1977
GUMBI, T.	Regional Geologist Bulawayo 1994 - 1996
GUMBO, M.	Geologist 1985 – 1987
GUNDANI, G.	Geologist (Data Management) 2002 - 2003
HAHLANI, W.	Geologist 2009 - 2010
HAHN, Dr L.	Project Leader/Geologist (BGR) 1986 - 1989
HARRISON, N.M.	Geologist 1959 - 1969; Regional Geologist Gwelo/Salisbury 1969 - 1975; Chief Field Geologist 1976 - 1978; Deputy Director 1978 – 1981
HATASAKI, T.	Geologist (MMAJ/JICA) 1986 - 1988 (Midlands Gold)
HATHERLY, R.	Geologist 1975 - 1978
HAWADI, M.T.	Geophysical Technician 1982 - 1987; Geophysicist 1987 - 1989; Principal Geophysicist 1989 - 1999; Deputy Director 1999 - 2003; Director 2003 -
HAYNES, Dr L.	Assistant Economic Geologist 1983 – 1984
HETREED, P.A.	Geophysical Technician 1975 - 1976
HILLER, Dr K.	Hydrocarbons Consultant (BGR) 1990 - 1996
HOWES, D.R.	Assistant Regional Geologist Bulawayo 1974 - 1976
KALBSKOPF, S.P.	Assist. Regional/Regional Geologist Harare 1982 – 1988
KAMBARAMI, E.T.	Geophysical Technician 1/3/83 - 1989

KAPONDO, T.	Geophysicist 1997 - 2004
KASHIRI, T.	Geologist 2009 -
KATEMAUNZANGA, D.	Geologist 2005 - 2006
KEEP, Dr F.E. (d)	Mining Geologist 1926 - 1929
KIRENGA, Ms C.	Geologist 2006
KIRKPATRICK, I.M.	Geologist 1967 - 1971; Chief Field Geologist 1972 - 1975; Regional Geologist Salisbury 1976
KOMURA, A.	Geologist (MMAJ/JICA) 7/83 - 11/85 (Bindura/Shamva nickel); 1986 - 1987 (Midlands gold)
KONINGS, M. H. (d)	Geophysicist (CIDA) 1989 - 1991
KRANSDORFF, Dr D. (d)	Geologist 1934 - 1935
KUHME, A.K.	Geologist 1971 - 1973
KWENDA, G.T.	Mine Geologist Gweru 1991 - 1996; Chief Economic Geologist 1996 - 2002
LAMONT, Dr G.T. (d)	Geologist 1947 - 1949
LAUDERDALE, J.N.	Geologist 1984 -1987; Assistant Regional Geologist Harare 1987 - 1989
LEACH, A.	Geologist 1977 - 1978
LEITNER, E.G.	Geologist 1967 - 1973
LEPPER, Dr J.	Geologist (BGR) 1982 - 1984
LEYSHON, Dr P.R.	Geologist 1963 - 1969
LIGHT, Dr M.P.R.	Mineralogist 1972 - 1973; Geologist 1973 - 1978
LIGHTFOOT, Major B. A. (d)	Geologist 1911 - 1914; 1921 - 1934; Director 1934 - 1946
LINNELL, R.J.	Geologist 1967 - 1970
LOCKETT, Dr N.H.	Geologist 1970 - 1976
LOWENSTEIN, Dr P.L.	Chief Economic Geologist (BGS/ODA) 1989 - 1995
LUNGA, S.	Geologist 1993 - 1995; Principal Geologist 2009 -
LUNN, Dr J.W. (d)	Mineralogist 1926 - 1927
MACGREGOR, Dr A.M. (d)	Geologist 1915 - 1916; 1919 - 1946; Director 1946 - 1948
MACHOKOTO, Ms C.E.	Geologist/Senior Geologist, Data Management 1990 - 1997
MADARI, N.L.T.	Geologist 2006 -2008
MADE, A.B.	Geologist (Remote Sensing) 1981 - 1988; Chief Officer National Remote Sensing Facility 1988 - 1990
MADZIMA, G.	Assistant Regional Geologist Harare 1983
MAFARA, Ms L.S.	Economic Geologist 1997 - 2003
MAGALELA, W.	Regional Geologist Gweru 1987 - 1995; Deputy Director 1995; Acting Director 1996 - 1997; Director 1997
MAGUCHU, F.S.	Geophysical Technician 1985 - 1987
MAHATI, P. (d)	Assistant Regional Geologist Bulawayo 1983 - 1984; Regional Geologist Bulawayo 1985-1988; Geologist 1988–1989
MAISERA, Ms	Geologist 2009 –
MAKANDA, L.D.	Geophysical Technician 1998
MAKOVORE, O.	Geologist 2002 - 2005
MAKUNI, C.W.	Geologist 1985 - 1986
MAKUVAZA, A.	Geophysicist 2006 - 2008
MAMUSE, A.	Geologist 1997 - 2004
MANGEZI, M.	Geologist 2009 -
MANGORO, W.	Geological Technician 2000
MANGWENGWENDE	Geophysical Technician 1996
MARIRANYIKA, B.	Geophysical Technician 1982 - 1988
MARTIN, Dr A.	Assistant Regional Geologist Bulawayo 1971 - 1973; Geologist 1973 - 1976
MARTIN, H.J. (d)	Mineralogist 1954 – 1963
MASHITA, C.M.	Geophysical Technician 1983 - 1990

MASIYAMBIRI, S. (d)	Regional Geologist Harare/Midlands 1995 - 2005
MASUKU, Ms N.	Geophysicist/Chief Geophysicist 1990 - 2007
MAUFE, H.B. (d)	Director 1910 - 1934; Geologist 1940 – 1945
MAWOKO, L.	Cartographer (Data Management Section) 1997 - 2004
MAYIDA, I.	Geophysicist 2006 - 2007
MILIAN, J.F.	Geologist (BRGM) 1983 - 1984; Assistant/Acting Regional Geologist Gweru 1984 - 1987
MILNER, S.A.	Geologist 1976 - 1979; Assistant Regional Geologist Bulawayo 1979 - 1980
MJANJA, Ms R.F.	Senior Geologist 2002 – 2006
MKHWANANZI, P. (ne'e DLODLO) (d)	Economic Geologist 1997 - 2000
MLILO, G.	Geophysical Technician 1991 – 1996
MNYAMA, A.	Geophysical Technician 1985 - 1986
MOLYNEUX, A.J.C. (d)	Geologist 1918 - 1920
MORGAN, S.C. (d)	Geologist 1926 - 1929; Mineralogist 1927
MORRISON, E.R. (d)	Assistant Regional Geologist Bulawayo 1967 - 1969; Economic Geologist 1969 - 1976; Deputy Director 1976 - 1978; Director 1978 - 1989
MOYO, A. (d)	Assistant/Acting Regional Geologist Bulawayo 1988 - 1990
MPINDIWA, S.	Geologist 2006 -
MPOFU, P.M.	Geophysicist 1991 - 1994
MTSVANGA, N.A.	Geologist 1984 - 1988
MUCHEKENI, N.	Geologist 2006 - 2007
MUCHEMWA, E. (ne'e SHERINI)	Geologist/Assistant Mineralogist 1983 - 1986
MUGANDANI, E.T.	Geologist 2005 -
MUGOVA, E.	Geologist 2005
MUGUMBATE, F.	Geologist 1987 - 1995; Acting Regional Geologist Harare 1995 - 1996; Acting Director 1997 - 2002; Deputy Director 2002 -
MUIRHEAD, J.D.	Geologist 1967 - 1974
MUKANDI, M.A.	Principal/Chief Geologist Data Management 2000 -
MUPANDUKI, Dr N.S.C. (d)	Geologist (Remote Sensing) 1989 - 1993
MUPAYA, F.B.	Geologist 1990 - 1995; Regional Geologist, Harare 1996 -
MURANGARI, D.E.H.	Assistant Regional/Regional Geologist Harare 1980-1982; Deputy Director 1983 – 1985 (to Deputy Secretary for Mines H/O 1985 – 1988; Secretary for Mines 1988 - 1997)
MURAPA, T.E.	Geologist 2006 - 2008
MUREDZO, P.S.	Geologist 2006 - 2008
MUSHAYABASA, E.	Mine Geologist 1991 - 1993; Acting Regional Geologist Harare 1993 - 1996; Regional Geologist Bulawayo 1996 -1997
MUTAMBARA, T. (d)	Geologist 1992 – 1993
MUTENDA, M.	Geophysical Technician 1991 – 2008
MUUSHA, M.	Geologist
MUZANENHAMO, F.	Geologist 2008 -
NACHSEL-WESHKE, Dr. G.	Chief Economic Geologist (CIM) 1999 - 2002
NCUBE, Dr A.N.	Mineralogist 1980 - 1982; Assistant Economic Geologist 1982-1983
NCUBE, S.M.N.	Principal Mine Geologist Bulawayo 1990 - 1991; Deputy Director 1991 - 1993; Acting Director 1993 - 1994; Director 1994 -1995 (Seconded to H/O 1/96)
NDORO, M.M.	Geophysicist 2006 -
NGARA, M.T.	Geophysicist 1990 - 1991

NGWENYA, B.N.	Geologist 1981 - 1982
NIELSEN, F.W.	Geophysicist (CIDA) 1985 - 1987
NUTT, T.H.C. (d)	Assistant Regional Geologist Harare 1983 - 1985
NYAMAGODO, H.T.T.	Geologist 2006 - 2007
NYAMANA, O.	Assistant Regional Geologist Harare 1983 - 1984
ODELL, J.	Geologist 1969 - 1974
OESTERLEN, Dr P.M. (d)	Geologist (CIM) 1988 - 1991; Assistant Economic Geologist 1991 - 1994; Chief Field Geologist 1997 - 2001
ORPEN, Dr J.L.	Director 1990 - 1993
OTT, Dr G.	Geologist (BGR) 1988 - 1989
PALLOKS, H.H. (d)	Coal Geologist (BGR) 1982 - 1985
PECKOVER, Miss M.E. (d)	Assistant Mineralogist 1947 - 1948
PERRY, R.B.	Assistant Regional Geologist Bulawayo 1973 - 1974; Geologist 1975 - 1976
PHAUP, Dr A.E. (d)	Geologist 1930 - 1939; 1947 - 1962; Director 1962 - 1967; Editor 1967 - 1978
PITFIELD, Dr P.E.J.	Geologist (BGS/ODA) 1989 - 1993
PROST, Dr A.E.	Geologist (BRGM) 1981 - 1982
RANGANAI, Dr R.T.	Geophysical Technician 1982 - 1985; Geophysicist 1985 - 1988
REEKIE, J.	Mineralogist 1921 – 1924
REID, Ms C.N.	Geologist 2005 - 2007
RESCH, Dr M.	Geologist (BGR) 1982 - 1984; 1986 - 1988
ROBERTSON, Dr I.D.M.	Geologist 1965 - 1975
ROLIN, P.	Geologist (BRGM) 1981
RUSHWAYA, J.	Geophysicist 1993 - 1995
RUWENDE, T.F.	Acting/Regional Geologist, Gweru 2002 – 2008
RUZIVE, B.	Geologist 2002 - 2005
SHAWARIRA, L.	Geophysicist 2005 -
SHOKO, Dr D.S.	Geologist 1986 - 1987
SHOKO, U. (d)	Geophysical Technician 1991 - 1992; Geologist 1992 -1997
SIBANDA, R.	Geologist 2009
SIMANGO, R.Z.	Geologist 1985 - 1986
SIMANGO, S.	Geologist 1981 - 1986; Economic Geologist 1987 - 1988
STAGMAN, Dr J.G. (d)	Geologist 1946 – 1959; Regional Geologist Gwelo/Salisbury 1960-1967; Deputy Director 1967 - 1976; Director 1976 - 1978; Editor 1978 - 1980
STANDING, K.	Geophysicist (CIDA) 1985 - 1987
STEINER, Dr L.	Geologist (BGR) 1986 - 1989
STIDOLPH, P.A.	Geologist 1968 - 1978; Regional Geologist Bulawayo 1978-1981
STOCKLMAYER, Dr V.R.	Geologist 1969 - 1978; Chief Field Geologist 1978 - 1980
STOWE, Dr C.W.	Geologist 1958 - 1963
SUTCLIFFE, I. (d)	Assistant/Acting Regional Geologist Bulawayo 1972 - 1981; Regional Geologist Bulawayo 1982 - 1984
SUTTON, E.R.	Geologist/Geophysicist 1967 - 1976; Economic Geologist 1976 - 1977
SWIFT, Dr W.H. (d)	Geologist 1939 - 1962; Assistant Director 1962 – 1966; Regional Geologist Salisbury 1966 – 1969
TENNICK, F.P.	Geologist 1963-1968; Regional Geologist Bulawayo 1968 -1976
THOMPSON, D.W.	Geologist 1967 - 1970

THOMPSON, A.O.	Geologist 1970 - 1980
THORNTON, L.C. (d)	Mineralogist 1928 - 1929
TOLHURST, D.	Geologist 1975
TURNER, J.S.	Geologist/Assistant Regional Geologist Salisbury 1976 - 1978
TYNDALE-BISCOE, R. McI (d)	Mineralogist 1924 - 1926; Geologist 1926 - 1959 d. 5/4/96
USAIWEVU, E.	Geophysicist 1996 - 2005
VALLIERES, Dr A.	Regional Geologist Bulawayo (CIDA) 1989 - 1992; Ministry of Mines attachment 1994 - 1996 (Geoscientific Data Management Project)
WADA, F.	Geologist (MMAJ/JICA) 1989 – 1992 (East of Renco)
WATKEYS, Dr M.K.	Geologist 1976 - 1977
WATSON, Dr R.K.	Geophysicist (CIDA) 1991 - 1992
WATSON, R.L.A. (d)	Geologist 1951 - 1966; Regional Geologist Gwelo/Bulawayo 1966 - 1968
WHITE, W.C. (d)	Geologist 1946 - 1950
WILES, Dr J.W.	Geologist 1947 - 1966; Director 1967 - 1976
WILSON, J.A.	Geologist 1975 - 1977
WILSON, Dr J.F.	Geologist 1953 - 1966; Regional Geologist Bulawayo 1966-1967
WILSON, T.H. (d)	Geologist 1933 - 1936
WORST, Dr B.G. (d)	Geologist 1947 - 1966; Economic Geologist 1966
YOUNGE, O.L.	Assistant Regional Geologist Bulawayo 1982 - 1983
ZEALLEY, A.E.V. (d)	Geologist 1911 - 1918
ZHOU, K.B	Geologist/Assistant Regional Geologist Bulawayo 1985 - 1987
ZHOU, Dr P.P.	Geophysical Technician 1981 - 1982; Geophysicist 1982 - 1988; Senior Geophysicist 1988 - 1989
ZIZHOU, P. T.	Geologist 1993 - 1996

ASAS	-	Australian Staffing Assistance Scheme
BGR	-	Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover
BGS/ODA	-	British Geological Survey/Overseas Development Administration
BRGM	-	Bureau de Recherches Géologiques et Minièrs, Orléans
CIDA	-	Canadian International Development Agency
CIM	-	Centrum für Immigration und Entwicklung, Frankfurt
MMAJ/JICA	-	Metal Mining Agency of Japan/Japan International Co-operation Agency
UNDP	-	United Nations Development Program
(d)	-	Deceased

Great Dyke Platinum in the Region of Ngezi Mine, Zimbabwe: Characteristics of the Main Sulphide Zone and Variations that Affect Mining

A. J. du Toit and A.H. Wilson
andrew.dutoit@zimplats.co.zw allan.wilson@wits.ac.za

The Great Dyke of Zimbabwe is a major producer of platinum group elements (PGE) and mining operations are currently in expansion. The PGE are contained in a stratiform ore body known as the Main Sulphide Zone (MSZ) located near the top of the Ultramafic Succession. While the structure and distribution of metals in the MSZ are well known, recent investigations and exploration have shown that it is more variable than previously considered. Previous studies of the MSZ have regarded sulphide as the major controlling factor resulting in the sequential location of metals in the MSZ profile. It is observed that the various metal peaks are related to other compositional controls as well as sulphide and that the formation of the zone is the result of interplay of primary and late stage magmatic processes most likely involving multiple magmas.

The Great Dyke and its Platinum Occurences

Platinum and the platinum group elements (PGE) have been known to occur in the Great Dyke since 1925 where PGE were first discovered in what is now known as the Main Sulphide Zone (MSZ), which is the principal resource of platinum in the Great Dyke. The MSZ is located in the topmost orthopyroxenite of the Ultramafic Sequence and within a few metres of the overlying websterite layer, which in turn immediately underlies the gabbros of the Mafic Sequence. The MSZ is located in the same stratigraphic position in the five subchambers of the Great Dyke and therefore on a broad scale it is peripheral to the gabbroic bodies, which constitute stratigraphically the highest unit in the Great Dyke. As a geological entity the MSZ is the largest resource of platinum outside the Bushveld Complex of South Africa. Its size has encouraged active exploration and mining and in 2010 there are three major mines in operation and several intensive exploration initiatives.

Structure and Stratigraphy of the Great Dyke

The Great Dyke (550 km in length and 3 - 10 km wide) comprises three major magma chambers and five subchambers (Wilson & Prendergast, 1989; Wilson, 1996). The stratigraphy is broadly similar for all subchambers although there are differences in detail. The lowest exposed zone (the Ultramafic Sequence) is made up of ultramafic rocks (dunite, harzburgite, olivine pyroxenite and pyroxenite) arranged in a series of cyclic units, with a chromitite layer commonly occurring at the base of each of the cyclic units. The cyclic units are interpreted to have formed by periodic influx of magma into chambers, which were undergoing differentiation (Wilson, 1982). The magma slowly became more evolved as crystal fractionation overtook magma emplacement, which became progressively less as the magmatic event evolved. The uppermost part of the ultramafic stratigraphy occurs at the point where magma influxes took place on a minimal scale and gave rise to the P1 pyroxenite, host to the MSZ, and the topmost unit in the Ultramafic Succession.

The Nature of the MSZ

The MSZ is a laterally continuous, sulphide-hosted, multi-element stratiform ore body containing Pt, Pd, Rh, Au and base metals (Prendergast & Wilson, 1989). The other PGE occur in minor amounts. It is 2 - 10 metres wide (generally 2 -3 m) and shows sequential enrichment of metals, from the base upwards, of Pd, Pt, Au and base metals (Naldrett & Wilson, 1990; Pendergast & Keays, 1989).

One of the most remarkable features of the MSZ is the consistent pattern of a lower Pd-enriched subzone (Pt/Pd ratio of 0.7:1) and an upper Pt-enriched subzone (Pt/Pd ratio of 2.5:1). There is a narrow zone of transition between the two subzones but the ratio of Pt to Pd in the two subzones is essentially constant. The Au concentration occurs stratigraphically above the Pt-subzone. Detailed mineralogical and trace element studies show that the two subzones are closely related to compositions in the rock chemistry and are not solely related to the appearance of sulphide as suggested in previous studies (eg. Wilson, 2001).

Deviations from the General Metal Profiles

Understanding the distribution of metals in these subzones and where they occur in the mining operations is crucial to the successful exploitation of the ore body. In most areas, where the MSZ has been investigated, the PGE patterns are well established and, provided that underground sampling and grade control are effectively managed, mining operations are successful. However, there are variants and deviations from this pattern, which are becoming increasingly important as more areas of the MSZ are being targeted for mining. The nature of the MSZ changes consistently down-dip towards the axial regions where the mineralized zone becomes wider and of lower grade. The distribution is asymmetric between the east and west sides of the Darwendale and Sebakwe Subchambers with metal profiles, that although conforming to the established pattern, show differing degrees of metal dispersion. Of even greater significance is the recognition of those areas where major perturbations from the generally accepted patterns occur. In the Mhondoro area Wilson (unpublished report, 1998) described extended profiles where the PGE distribution occurred at low grade over intervals of greater than 10 m. In the Ngezi mining area, close to the central axis of the Great Dyke, there are zones of the MSZ that are associated with harzburgite or dunite where PGE concentrations are greatly reduced or even eliminated. Other deviations occur where Pt concentrations have been reduced to low levels and Pd values elevated to give Pd/Pt ratios of over 100. Au is also observed to rise to anomalously high values (over 8 ppm) within single samples.

Genesis of the MSZ and origin of the PGE

The genesis of the MSZ has been qualitatively explained by the sequential removal of PGE and Au in order of their D values with sulphide (Naldrett & Wilson, 1990; Prendergast & Keays, 1989). Detailed computer simulation using accepted D values for PGE between magma and sulphide fails to reproduce the complex and persistent trends observed in the rocks and therefore factors other than just metal-sulphide portioning need to be considered. It is suggested that while sulphide partitioning was a major controlling influence, the ore body formed as a multistage event possibly involving similar but heterogeneous magmas which had slightly different compositions and therefore may have been effective in different ways of carrying the PGE. The critical role of olivine-rich rocks in the MSZ is particularly informative. Emplacement of magmas that crystallized olivine may reflect the influx of more primitive primary magmas, which critically increased the sulphur solubility and therefore reduced its formation as a primary precipitate scavenging PGE. Alternatively, the ingestion of fluids may have caused a shift in the phase boundaries to induce crystallization of olivine and at the same time selectively mobilized the PGE.

Conclusions

As mining and associated evaluation of the MSZ progress, there is a greater need to understand the distribution of metals within the zone. Established theoretical models fail to reproduce the consistent and complex observed trends and there are an increasing number of examples of disrupted profiles. Ongoing research is developing a more thorough understanding of the emplacement history and giving new insights into the origin and distribution of the metals, as

well as disruptions within the MSZ.

References

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Wilson, A.H. and Prendergast, M.D. 1989. The Great Dyke of Zimbabwe I: Tectonic setting, stratigraphy, petrology, structure, emplacement and crystallization. *In*: Prendergast, M.D. and Jones, M.J. (eds.) *Magmatic Sulphides - the Zimbabwe Volume*. Institute of Mining and Metallurgy, London, 1-20.

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Wilson, A.H. 2001. Compositional and lithological controls on the PGE-bearing sulphide zones in the Selukwe Subchamber, Great Dyke: a combined equilibrium-Rayleigh fractionation model. *Journal of Petrology* **42**, 1845-1867.

News

Geology Department, University of Zimbabwe

Maideyi Meck

We are celebrating 50 years since
Prof. Geoff Bond inaugurated our Department
In November 1960

Maideyi is reported to have been involved in a vehicle accident near the university, and we understand that she is progressing well following her shock. We wish you a speedy recovery.

Contact details:

Name	Position	Other	Email	Cell
Mrs L. Meck	Lecturer	Chairperson	mabvira@science.uz.ac.zw	0912 906612
Mr D. Maguze	Chief Technician		dmaguze@science.uz.ac.zw	011 639792
Mrs G. Chipari	Secretary, DG		gchipari@science.uz.ac.zw	0912 950681
Ms N. Musundire	Secretary, MRC		nmusundire@science.uz.ac.zw	011 436649
Mr. F. Mugumbate	Chairman, GSZ	Geo Survey	fmugumbate@gmail.com	011 431109
Mr. H. Gumbo	GLF subcommittee		hgumbo@mweb.co.zw	0912 566912
Mr. K. Musiwa	GLF subcommittee	Mining, UZ	kudzie@eng.uz.ac.zw	0912 948915
DG Direct line/Fax:	263-4-303557			

Note: DG – Department of Geology; MRC – Mineral Resources Centre;

GLF – Geology Lecture Fund.

Geological Survey Department

ZIMBABWE

We're 100 years Old, so deserve to crow.
See our History by Forbes

Centennial Celebrations of the Geological Survey

The year 2010 marks an important milestone for the Zimbabwe Geological Survey. Having been established in 1910, this year marks a century of existence. Such an event should be celebrated with pomp and fanfare. Regrettably, the year has come during hard times, when the morale of the current staff is low due to poor working conditions. It has not been easy to organize celebrations to mark this important date. In this regard, the Geological Society of Zimbabwe should be commended for organizing an international geological symposium to celebrate the Geological Survey's coming of age.

Meanwhile, the Geological Survey is making frantic efforts to organize the publication of a magazine dedicated to celebrating our centenary. The Department is also organizing a cocktail party to be held on the evening of 20th October 2010, a night before the symposium kicks off.

Staffing matters

Not much has changed concerning the staffing situation at Maufe Building. William Hahlani, a geologist who was on 3-months industrial attachment at Renco Mine, resigned to join a local company early July. Mathias Ndoro is undertaking an MSc in Exploration Geophysics at the National University of Science and Technology in Bulawayo.

Several members of our staff attended meetings and workshops outside Zimbabwe. Mr Hawadi, the Director, accompanied the Minister for Mines and Mining Development to Israel and St Petersburg in Russia for the Kimberley Process and the World Diamond Council meetings, respectively. The Process Certification Scheme meeting and issues pertaining to the sale of Zimbabwean diamonds were discussed. It was resolved that the Kimberley Process Monitor will visit Zimbabwe to inspect and authorize the sale of Zimbabwe's diamonds. Mr Hawadi also accompanied the Minister to Seoul, South Korea for an investment conference. Deputy Director Forbes Mugumbate attended a SADC meeting in Johannesburg to relaunch the SADC Committee of Geological Surveys. F.B. Mupaya as Regional Geologist attended a conference on

the promotion of investment in mining in Zimbabwe and Tanzania, whilst Senior Geologist E.T. Mugandani attended a workshop on Energy Policies in China.

Bornwell Mupaya

MINING INDUSTRY NEWS

Micthell Maisera

Mining policy

It's pleasing to note that the government is making frantic efforts to improve the Indigenization Act. It has been realized that one cannot use similar rules across all sectors. Therefore, special committees were established to review and recommend indigenization routes for particular economic sectors. Most sectors argue for a model in which a listing on the Zimbabwe Stock Exchange, employee share ownership schemes, social and community development and other concepts are considered. It is hoped that this new position will unlock the flow in mining investment, which has been held up by uncertainty over the indigenization and empowerment legislation.

Developments in Mineral Commodities

Platinum Group Metals (PGMs)

Zimbabwe's platinum industry is enjoying a steady growth due to the increased global platinum prices. Mimosa mining company realized revenue of $72 million in its fourth quarter ending June 2010, a 2.9% increase from the previous quarter. In July production rose by 16%. On a similar note ZIMPLATS recorded significant increases in platinum and PGMs output in the quarter ending June 2010. It started implementing its US$445 million Ngezi phase 2 expansion project in August.

Gold

The gold sector is still struggling, despite a 45% (4.03t) increase in production by June compared to last year, which was brought about by an increase in investment and recapitalisation of mining ventures. Power outages continue to hamper planned operations. Probably, the idea of public-private sector partnerships will resolve this problem through establishment of a number of thermal power plants in the near future.

Coal

Some of the companies awarded Special Grants for coal exploration and exploitation, such as Monaf Investments, Apex Petroleum, Makrock Exploration and Mining Plc, Liberation Mining and Lagerty Investments, have begun their resource assessments through the initiation of exploration drilling programmes. Makomo Resources (Pvt) Ltd intends to spend US$40 million in coal exploration at the Entuba coal locality near Hwange. It plans to deliver at least 60 000 tonnes of coal in its first month of production. Hwange Colliery Company Limited began resuscitating its coke oven battery, the commissioning of which is planned for September. With potentially huge coal resources, Zimbabwe is expected to be an independent power producing country in the near future.

Diamonds

At last the controversy over the sale of Zimbabwe's diamonds, especially those from Marange accumulated over the past 3-4 months, culminated in an auctioned in August. The first batch of 900 000 carats from Marange was sold on 12th August to realize US$72 million. This followed a positive report by the Kimberley Certification Monitor at the World Diamond Council in Russia that the country's diamonds are clean. Due to Marange diamonds having drawn world attention, three high-powered delegations visited Zimbabwe early August on fact finding missions

concerning the diamonds. First were the Association of African Diamond Producing Countries, then the Kimberley Process Certification Scheme Review Mission and lastly, the Monitor Mr Abbey Chikane.

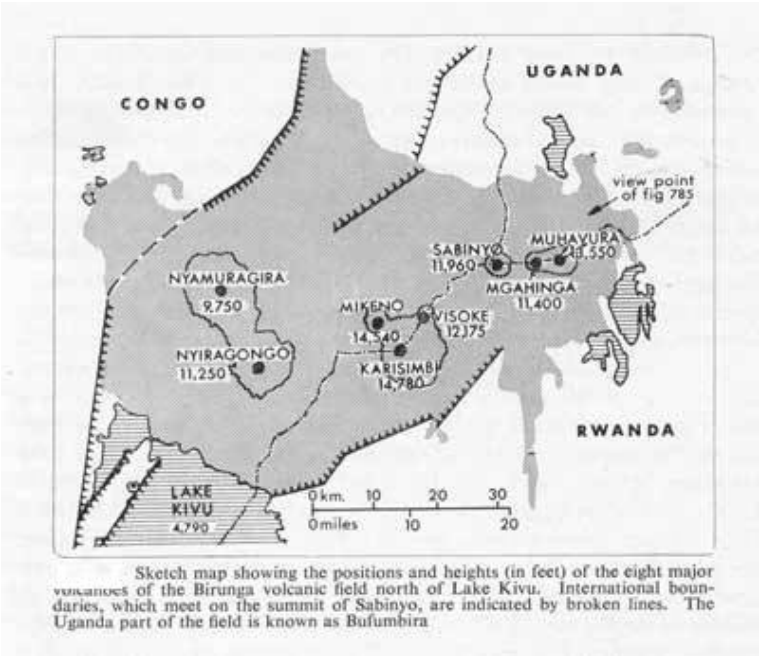
Mining equipment

In July, Gold Search (Pvt) Ltd commissioned a US$500 000 multi-purpose drilling rig. It has the capability of reaching a vertical depth of 1800 metres. This will be very useful in the mining industry to investigate ore bodies that lie at depth.

News about Zim Geoscientists

Xavier Marchal, who has spent the past five years as Head of Delegation for the European Union in Zimbabwe, and who has supported our own Society, has been transferred to take up his post in Addis Ababa, Ethiopia. His passion for Africa and for the province of his birth, Kivu in the DRC, drew him to visit the Virunga volcanic World Heritage Site where he climbed one of two active volcanoes, Nyiragongo (3,500 masl), the cone of which houses one of only five lava lakes in the world. He described the experience as "Awesome", and shares some of his photographs with us. He has already been visiting volcanic features in Ethiopia. We wish him well.

Fig 2: The Nyiragongo lava lake at night and view from the crater edge east-north-east to Mikeno (4,400m) in DRC and Karisimba (4,500m) in Rwanda. Photos by Xavier Marchal, 2010.



Sketch map showing the positions and heights (in feet) of the eight major volcanoes of the Birunga volcanic field north of Lake Kivu. International boundaries, which meet on the summit of Sabinyo, are indicated by broken lines. The Uganda part of the field is known as Bufumbira

Fig 3: From Holmes, 1965. Principals of Physical Geology.

Ian Kirkpatrick says, "I shall not be attending the centenary meeting but please pass on my best wishes for a successful venture. I'll be seeing **Eric Sutton** in a couple of weeks with **Peter Leyshon**, so the UK branch of the Survey is still alive."

Pat Stidolph says," I am very sorry not to be attending the Centenary conference in October as I have only recently made a trip to South Africa for a celebration of my mother's 90th birthday in Grahamstown. It will be a most interesting nostalgic event I am sure."

And **Peter Fey** responds, "I felt quite nostalgic reading about the field visits being planned for the Survey's centennial celebration. I also felt that I am now in a bit of a rut, dealing solely with iron ore. **Paddy Belstead**, who very recently celebrated 50 years of drafting, does plan printing for me, and at his office I often bump into **Nick Lockett**, who is still running his one-man remote sensing business in West Perth. Nick relates that **Ian Robertson** has just retired from CSIRO and that **Vernon Stocklmayer** has recently undergone a back operation."

Steffen Kalbskopf is still working in the DRC where he is involved in drilling a Kupferschiefer-style stratabound Cu deposit 25 km west of Kolwezi. **John Lauderdale** is managing a project at Kakanda/Luita not too far from Kolwezi.

Andrew du Toit with **Allan Wilson** attended the 11th International Platinum Symposium in Sudbury, Canada from 21st to 24th June where they met up with Gordon Chunnet, Thomas Oberthur and Harry and Martene Wilhelmje.

Please provide us with news about yourself or other geologists. We need to keep in touch with all of you out there. E-mail drchats@yahoo.com or makari@zol.co.zw

GSZ Research and Development Fund

Enquiries relating to the distribution of funds through this facility should be made through the standing Chairperson.

Conferences

SEG Conference, 'The Challenge of Finding new Mineral Resources'. Keystone, Colorado, USA, 2nd – 5th October, 2010. www.seg2010.org

Zimbabwe Geological Survey 100th Anniversary Symposium, Harare – 21st – 22nd October, 2010. Field trip – 23rd – 25th October.

CAG 23 - "Together in Africa for a Leading Role in Geoscience" - 23rd Colloquium of African Geology, 8-14 January, 2011, University of Johannesburg, South Africa under the auspices of the Geological Society of Africa. Scientific Sessions, Workshops, Short Courses and Field Excursions. For further details see http://www.cag23.co.za or e-mail cag23@uj.ac.za or hmouri@uj.ac.za

10th International Kimberlite Conference, 6 – 11 February, 2012, Bangalore, India. 10ikcbangalore.com

The 23rd International Geological Congress, Cape Town, South Africa – 2016.

A HUNDRED YEARS OF GEOLOGICAL ENDEAVOUR THE PAST IS KEY TO THE FUTURE

20th – 25th October 2010

THIRD CIRCULAR

The Zimbabwe Geological Survey celebrates its 100th anniversary this year. To commemorate the achievements of the past century, the Geological Society of Zimbabwe is hosting a symposium to encourage scientists to visit Zimbabwe to share in and contribute to the debate on those aspects of geology for which Zimbabwe is famous.

Following on from earlier circulars, this circular gives more specific details of the programme, costs etc.

Pre-Symposium Field Excursion **20th October 2010**

Day trip to northern part of Great Dyke led by Prof Allan Wilson

Depart Crowne Plaza, Harare 7am **Wednesday 20th October and return 5:30pm**

Cost $20, for trip and packed lunch.

Please let us know if you need transport **by the 1st October at the latest** and we will arrange lifts if possible. If there is sufficient requirement we may arrange a bus at a cost to be advised.

Symposium - Technical Sessions **21st & 22nd October 2010**

The sessions will be held at the Crowne Plaza Hotel in Harare.

The cost of the two day conference, including registration, teas and lunches, will be US$75 per person if paid before the 8th October, after that the cost will be US$100 per person.

Limited student discounts are available and students should apply through their department.

Accommodation at the Crowne Plaza is currently US$80 per night (bed only) for local residents and $90 per night (bed only) for non-residents. Bookings should be made direct with the Crowne Plaza email: reservations@crownep.africansun.co.zw, telephone: +263-4-704501. You will need to point out that you are attending the conference to get the discounted rates. The Crowne Plaza is in the centre of Harare and is in close proximity to several other hotels.

Alex Du Toit Lecture **22nd October 2010**

We are very pleased to announce that the prestigious Alex du Toit Memorial Lecture is incorporated into the programme. This year, Professor Terrence McCarthy of WITS has been delivering this public lecture series throughout Southern Africa and we expect this to be one of the highlights of the symposium.

Post-Symposium Field Excursion **23rd - 25th October 2010**

Three days touring the Belingwe Greenstone Belt and the Great Dyke led by Dr Tony Martin.

Depart Crowne Plaza, Harare **7am Saturday 23rd October**

Day 1	Visit - Manjeri Unconformity, Reliance Type Section, Zeederbergs Ngezi, Cheshire Conglomerate
Night 1	Nilton Hotel, Zvishavane
Day 2	Visit - Mtshingwe Dyke View, Hokonui Agglomerate, Hokonui Vent Agglomerate, Chingezi Gneiss, Manjeri Unconformity West, Reliance Halls Flow, Reliance Ngezi
Night 2	Nilton Hotel, Zvishavane
Day 3	Visit - Shabani Gneiss, Great Dyke Pyroxenite, Bougai Platinum Exploration, Shurugwi Peak View

Return to Crowne Plaza, Harare **5pm Monday 25th October**

The cost of the three day trip, including accommodation and meals but excluding transport, will be US$175 per person if paid before the 8th October, after that the cost will be US$200. Transport will be arranged, subject to a minimum requirement for 15 people, and this will cost an extra US$150 per person and must be paid for on the 21st October. **Please advise if you require transport by the 1st October at the latest.**

Limited student discounts are available and students should apply through their department.

Those who do not require accommodation, such as residents of Zvishavane, should contact the Secretary to find out details of the field trip itinerary and the costs that apply to them.

Bank Details

Payment can be made in cash or by transfer to:-

Geological Society of Zimbabwe
Barclays Bank
Kurima House
Harare
Account Number 2157-6533195
Swift Code BARCZWHX

Please send proof of payment by fax or scan so that we can reconcile payments to:

The Secretary
Fax: +263-4-332497
Email: gsz2010conf@gmail.com

Provisional Programme:

ZIMBABWE GEOLOGICAL SOCIETY
CELEBRATING 100 YEARS OF ZIMBABWE GEOLOGICAL SURVEY

A HUNDRED YEARS OF GEOLOGICAL ENDEAVOUR
THE PAST IS THE KEY TO THE FUTURE

21 – 22 OCTOBER 2010
CROWNE PLAZA HOTEL, HARARE

THURSDAY 21 OCTOBER 2010		
START	**TOPIC**	**SPEAKER**
07.45	REGISTRATION	
08.15	WELCOME	DANIEL CHATORA, CHAIRMAN GEOLOGICAL SOCIETY
08.40	OPENING	DAVID MURANGARI, MANAGING DIRECTOR OF BINDURA NICKEL CORPORATION
09.05	ZIMBABWE GEOLOGICAL SURVEY	TEMBA HAWADI, DIRECTOR OF ZIMBABWE GEOLOGICAL SURVEY
09.30	THE ZIMBABWE-ANTARCTICA LINK: A FORELAND BASIN MODEL FOR THE LATE MESOPROTEROZOIC UMKONDO-RITSCHERFLYA BASIN, PRIOR TO ITS PAN-AFRICAN DEFORMATION	SHARAD MASTER, WITS
09.55	TEA	
10.15	**THE ZIMBABWE GEOLOGICAL SURVEY MARKS ITS CENTURY OF ACHIEVEMENT, 1910 – 2010 (Keynote)**	**TIM BRODERICK, JEREMY PRINCE & ASSOCIATES**
11.30	MAPPING CHALLENGES FACING AFRICAN GEOLOGICAL SURVEYS IN 2010 AND BEYOND	NICK BAGLOW, COUNCIL FOR GEOSCIENCE
11.55	AN UPDATE ON THE LIMPOPO BELT	JAN KRAMERS, UJ
12.20	TECTONIC MODELS FOR THE LIMPOPO COMPLEX	STEVE McCOURT, UKZN
12.45	LUNCH	
14.00	**FINGERPRINTING OF CONFLICT MINERALS WITH FOCUS ON "COLTAN" (TANTALUM ORES) – NEW ANALYTICAL DEVELOPMENTS AND DISCRIMINATION OF AFRICAN ORE PROVINCES (Keynote)**	**THOMAS OBERTHÜR, BGR**
14.50	THE TECTONIC EVOLUTION OF THE ZIMBABWE CRATON: A UNIFYING PLATE TECTONIC HYPOTHESIS OF THE ca 3.5-3.2Ga SEBAKWE PROTOGRATON UNDER EXTENSION, ARC MAGMATISM AND HIMALAYAN-TYPE INDENTATION	MARK TSOMONDO, METALLON GOLD
15.15	TEA	
15.35	CORE LOGGING IN THE 21ST CENTURY	JOHN ORPEN, STEREOCORE™ PHOTOLOG
16.00	INVESTIGATION OF THE TEMPORAL RELATION OF THE DIORITE AND TRONDHJEMITE ROCKS IN THE TATI GRANITE-GREENSTONE TERRAIN, NE BOTSWANA	ZIBISANI BAGAI, UNIVERSITY OF BOTSWANA

FRIDAY 22 OCTOBER 2010

START	**TOPIC**	**SPEAKER**
8.00	**THE BIRTH OF TWO GREAT LAYERED INTRUSIONS – THE GREAT DYKE AND THE BUSHVELD COMPLEX (Keynote)**	**ALLAN WILSON, WITS**
8.50	ANDEAN-TYPE PLATE TECTONIC EVOLUTION OF THE MIDLANDS GREENSTONE BELT; NEW EVIDENCE FOR EXTENSIONAL AND COLLISIONAL TECTONICS IN THE c2.74Ga UPPER BULAWAYAN SUPERGROUP	MARK TSOMONDO, MIDLANDS GEOLOGICAL SERVICES
9.15	PROCESSING AND INTERPRETATION OF AIRBORNE DATA OF MOZAMBIQUE	DANTA MARIZANA, NATIONAL

		DIRECTORATE OF GEOLOGY OF MOZAMBIQUE
9.40	GEOCHEMICAL INVESTIGATION OF THE DOMBOSHABA GRANITE AND THE KALAKAMATI MONZONITE PLUTONS IN THE VUMBA GRANITE-GREENSTONE TERRAIN, NE BOTSWANA: EVIDENCE FOR SANUKITOID AND CLOSEPET-TYPE MAGMATISM?	ZIBISANI BAGAI, UNIVERSITY OF BOTSWANA
10.05	TEA	
10.25	THE EARTH'S CORE HAS GONE TO POTS	MICHAEL WATKEYS, UKZN
10.50	ZIMBABWEAN ARCHAEAN STROMATOLITES AND THE HISTORY OF OXYGEN IN THE AIR	EUAN NISBET, ROYAL HOLLOWAY, UNIVERSITY OF LONDON
11.15	BEFORE 1910. ARCHAEOLOGY OF NYANGA REVEALS DIRECT EVIDENCE OF PRECOLONIAL GOLD EXPLORATION AND RECOVERY IN ZIMBABWE'S EASTERN HIGHLANDS	ANN KRITZINGER
11.40	THE HYDROGEOLOGY AND DEVELOPMENT POTENTIAL OF SAND RIVERS	DAVID LOVE, WATEMET
12.05	THE CONTRIBUTION OF GEOPHYSICAL EXPLORATION TECHNIQUES TO SULPHIDE NICKEL EXPLORATION IN BURUNDI	TENYEARS GUMEDE
12.30	WHOLE ROCK GEOCHEMISTRY: A STRATIGRAPHIC TOOL IN THE BOTSWANA KAROO	SORCHA DISKIN, UNIVERSITY OF BOTSWANA
12.55	LUNCH	
14.00	SUMMARY	SHARAD MASTER, WITS
14.45	TEA	
START OF PUBLIC SESSION		
15.15	**ALEX DU TOIT LECTURE, HISTORY AND INTRODUCTION**	
15.25	**ALEX DU TOIT LECTURE : THE OKAVANGO DELTA AND ITS PLACE IN THE GEOMORPHOLOGICAL EVOLUTION OF SOUTHERN AFRICA**	**PROFESSOR TERRENCE McCARTHY, WITS**

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