

# Harry M. Parker

## GAA Honorary Life Member

### Education

- ✚ B.Sc. and PhD. Geology, Stanford University (1967, 1975)
- ✚ A.M. Geology, Harvard University (1969)
- ✚ MSc. Statistics, Stanford University (1974)

### Employment:

- ✚ Exploration Geologist, The Hanna Mining Co. (1968–75)
- ✚ General Manager Geology and Geostatistics, Fluor Corporation (1975–89)
- ✚ Technical Director, MRDI and AMEC (1989–Present)

### Major Projects:

#### 1978

- ✚ Used sequential indicator and gaussian conditional simulation to establish drill hole spacing for New Mexico uranium exploration.

#### 1979

- ✚ Used conditional indicator and lognormal distributions to determine reserves for Imouraren (U), Niger, with Andre Journel.

#### 1981

- ✚ Used conditional indicator and lognormal distributions to determine reserves for Porgera (Au), Papua New Guinea.

#### 1987

- ✚ Developed Cu–Co resource model for Nchanga Open Pit, Zambia using ordinary kriging within geological domains. Followed by modeling UG resources and study of grade factors versus extraction for panel-cave mine.

## **1990**

- ✚ Developed Au resource model for Lihir using ordinary kriging; assisted Ed Isaaks with conditional simulation and post-processing to obtain recovery factors.

## **1989–Present**

- ✚ Developed system of grade zones, simple kriging and firm boundaries using limitations on variogram values to select samples. Used at Bingham Canyon (Cu-Mo-Au-Ag) USA, Goldstrike Au USA, and Escondida Norte Cu Chile.

## **1993**

- ✚ Developed breakeven indicator method of grade control at Jerritt Canyon (Au), USA. Supported work using conditional simulation.

## **1996**

- ✚ Led independent valuation of all mineral assets (mines and prospects) to support privatisation of CVRD (Fe,Mn,Cu,Au,K,Al,Kaolin), Brazil.

## **1996–2000**

- ✚ Led preparation of Technical and Competent Person's Reports to support privatisation of ZCCM (Cu, Co), Zambia. Worked for both buyer and seller at same time to save both money.

## **1996–1997**

- ✚ Expert witness in defence of CRA, Kelian Mine (Au) Indonesia

## **1999–2001**

- ✚ Developed MIK postprocessor for change of support (using indirect lognormal method); compared to sequential indicator simulation and uniform conditioning, with Andy Twaites and John Forkes. There is no clear winner. If anyone tells you that one of these methods is significantly better than the other, they are selling snake oil.

## **2000–Present**

- ✚ Led resource modeling projects for Cu, Zn, Mo, Ag, Bi, Co, Fe, As, Pb at Antamina (skarn) Peru using a variety of kriging methods

## **2001–Present**

- ✚ Led resource modeling for Ni, Cu, Pd, Pt prospect at Platreef RSA. Used MIK to estimate in situ dollar value, performed change of support, predicted grades via regression.

## **Other Projects (Australia)**

### **1977**

- ✚ Used sequential indicator simulation to elucidate ore shoots at Mt Razorback (Sn), Tasmania

### **1982**

- ✚ Used kriging to develop resource model for Rundle Oil Shale, Queensland, with John Cottle

### **1984**

- ✚ Used kriging to develop resource model for Olympic Dam, South Australia, with John Cottle

### **1993–1997**

- ✚ Audited and advised on resource modeling, BHP Iron Ore operations, Western Australia

### **1995**

- ✚ Audited and advised on resource modeling and conditional simulation to optimize position of hangingwall and footwall, Century Zn, Queensland

### **2002–2003**

- ✚ Designed conditional simulation to assess risk and assist in resource classification, Koniambo (Ni), New Caledonia, with Mark Murphy



Dr Harry Parker (left) on site with John Espinoza (right).

## **Personal Statement**

I have now been involved in using geology and geostatistics for resource modeling for about 30 years. Like the late Haddon King, I have found that understanding the geological controls (not the exploration geologist's guides) on ore occurrence to be of tantamount importance. In general, an ounce of geology is worth a pound of geostatistics; this may be disappointing to geostatisticians with no geological background. Tough.

Where geostatistics really shines is in the assessment of the impact of mining selectivity on tonnage, grade and metal content of resource models. Conditional simulation is the coming tool for this purpose, and it is a major goal to see this tool used on all "bankable" feasibility studies. In addition, conditional simulation should be used to support resource classification and risk assessment.

I have fought hard and continue to fight for training personnel to perform geostatistical studies that are rigorous in their documentation, as the devil is often in the details. Resource models should be transparent in all aspects. I despise black-box software and consultants that hide behind proprietary methodology. I have always been free in explaining methodology and in giving away software; I have never lacked for work. The publicly available GSLIB package is a notable step in the right direction.

The academic community has much to offer geostatistics; it is a shame that research and training in the universities is so poorly supported by the mining industry, including consulting organizations. Many of the advances made in mining geostatistics during the 1970s and 1980s resulted from collaborative research. If geostatistics is to flourish, these ties must be re-established. Otherwise, the field will continue to develop at a snail's pace, led by the whims of resource modeling software vendors.