



**BULLETIN DES SEANCES
MEDEDELINGEN DER ZITTINGEN**

53 (4)

**ACADEMIE ROYALE
DES SCIENCES D'OUTRE-MER**

Sous la Haute Protection du Roi

**KONINKLIJKE ACADEMIE
VOOR OVERZEESE WETENSCHAPPEN**

Onder de Hoge Bescherming van de Koning

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rue Defacqz 1 boîte 3
B-1000 Bruxelles (Belgique)

Defacqzstraat 1 bus 3
B-1000 Brussel (België)



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COMMUNICATIONS SCIENTIFIQUES

WETENSCHAPPELIJKE MEDEDELINGEN

Séance plénière du 18 octobre 2007

Plenaire zitting van 18 oktober 2007

Introduction / Inleiding

par/door

Christian STURTEWAGEN*

Excellenties, Dierbare Consorores en Confraters, Geachte Dames en Heren,

Het is een bijzondere eer voor mij U op deze plechtige opening van het academisch jaar van de Koninklijke Academie voor Overzeese Wetenschappen te kunnen verwelkomen.

Telkenmale stellen we ons bij het begin van het jaar de vraag: welke opdracht heeft onze Academie.

Volgend jaar, in 2008, zal het precies tachtig jaar geleden zijn dat onze Academie werd opgericht weliswaar onder de naam „Koninklijk Belgisch Koloniaal Instituut”. In 1954 tot „Koninklijke Academie voor Koloniale Wetenschappen” omgedoopt, werd onze Instelling in 1959 dan de „Koninklijke Academie voor Overzeese Wetenschappen”. In 2009 zullen we dus vijftig jaar onder deze benaming bestaan. Dit is zeer jong, zeker voor een wetenschappelijke academie, vooral indien men vergelijkingen maakt met bijvoorbeeld de *Accademia Nazionale dei Lincei* (in Italië) en de *Pontificia Accademia delle Scienze* (in Vatikaanstad) (eigenlijk vormden zij oorspronkelijk één academie; de geschiedenis heeft er twee van gemaakt), die teruggaan tot 1603.

Ces deux académies sont les plus anciennes du monde. Même la fameuse «Académie française» n'a été créée qu'en 1635, plus de trente ans plus tard, par le Cardinal Richelieu.

Notre Académie est donc une académie relativement jeune à cause de son objet d'étude: les sciences d'outre-mer. Mais il fallait d'abord avoir l'outre-mer, c.-à-d. des territoires qui deviendront des colonies. Pour notre Académie d'outre-mer, c'était le Congo belge et les territoires sous tutelle du Ruanda et de l'Urundi, comme on disait dans le temps. Une colonie belge ou des territoires sous tutelle belge n'existent plus depuis 1962. Ce changement historique a entraîné pour notre Académie un changement d'objet d'étude. Là où dans le passé on étudiait exclusivement l'Afrique belge, notre Académie s'est élargie

* Président de l'Académie, rue Defacqz 1/3, B-1000 Bruxelles (Belgique). / Voorzitter van de Academie, Defacqzstraat 1/3, 1000 Brussel (België).

aux pays, nations et cultures non occidentaux. Cela a amené une plus grande diversification à l'intérieur même de notre institution mais a également conduit à un éparpillement des disciplines.

Damit Rechnung haltend, hat unsere Akademie sich während dieser letzten Jahre intensiv eingesetzt ihre Identität weiter zu suchen; darum auch werden wir bald neuen Statuten haben, die diesen neuen Herausforderungen Gestalt geben werden.

With this new, challenging and invigorating perspective ahead, it is for me an honour and a pleasure to open this academic session.

Thank you for your kind attention.

Egyptosofie: ideologie of wetenschap? *

door

Christian STURTEWAGEN **

TREFWOORDEN. — Egyptosofie; Egyptomanie; E. Hornung; J. Assmann; Wijsheid; „Zauberflöte”; Esoterisme.

SAMENVATTING. — Het is tien jaar geleden dat E. Hornung het woord „egyptosofie” smeedde. Voor hem is egyptosofie de wetenschap die als object de traditionele Egyptische wijsheid heeft, of wat daarvoor wordt aanzien. Egyptosofie veronderstelt geen kennis van de egyptologie. Een klassiek voorbeeld is de „Zauberflöte” van W. A. Mozart. G. Verdi's opera „Aida” is dan een paradigma van egyptomanie. De egyptosofie helpt ons het esoterisme ernstig te nemen.

MOTS-CLES. — Egyptosophie; Egyptomanie; E. Hornung; J. Assmann; Sagesse; «Flûte enchantée»; Esotérisme.

RESUME. — *Egyptosophie: idéologie ou science?* — Il y a dix ans, E. Hornung inventait le terme «égyptosophie». Selon lui, l'égyptosophie est la science ayant pour objet la sagesse traditionnelle égyptienne ou ce qui est considéré comme tel. L'égyptosophie ne présuppose nullement une connaissance de l'égyptologie. Un exemple classique est «La Flûte enchantée» de W. A. Mozart. «Aida» de G. Verdi est un paradigme d'égyptomanie. L'égyptosophie nous aide à prendre au sérieux l'esotérisme.

KEYWORDS. — Egyptosophy; Egyptomania; E. Hornung; J. Assmann; Wisdom; “Magic Flute”; Esotericism.

SUMMARY. — *Egyptosophy: Ideology or Science?* — Ten years ago, E. Hornung coined the term “Egyptosophy”. For him, egyptosophy is the science having for purpose traditional Egyptian wisdom or what is considered as such. Egyptosophy does not presuppose any knowledge of egyptology. A classic example is the “Magic Flute” of W. A. Mozart. G. Verdi's “Aida” is a paradigm of egyptomania. Egyptosophy may help us to take esotericism more seriously.

1. Inleiding

Toen het mijn beurt was om te spreken bij de opening van het academisch jaar heb ik lang getwijfeld of dit onderwerp wel geschikt is voor onze academie.

* Lezing gehouden tijdens de plenaire zitting van 18 oktober 2007. Tekst ontvangen op 25 juli 2008.

** Directeur van de Klasse voor Morele en Politieke Wetenschappen; docent Oudegyptische taal en cultuur, Universitaire Faculteit voor Protestantse Godeleerdheid, Bollandistenstraat 40, B-1040 Brussel (België).

We zijn immers een academie voor overzeese wetenschappen. Egypte is wel „overzees”, maar is egyptosofie dat ook?

We moeten toegeven: Egypte is in de mode. Dit is niet nieuw. Het oude Egypte heeft altijd de mensen geïntregeerd. Het begon al bij de oude Grieken en Romeinen. Het herbegon in de Renaissance. De grote „boom” is gekomen met Bonaparte, ofschoon zijn veldtocht in Egypte (1798-1801), waarvan de wetenschappelijke weerslag te vinden is in de *Description de l’Egypte* [1]*, eerder het gevolg dan wel de oorzaak was van een egyptomanische heropleving. De drang naar het oude Egypte komt altijd terug. Egypte, als overzees land, blijft de westerse mensen interesseren. Het is in die zin opvallend hoeveel mensen zonder egyptologische bagage Egypte bezoeken, en dit niet alleen voor de stranden en de snorkelmogelijkheden aan de stranden van de Rode Zee.

Er is nog een tweede reden.

Wanneer een wetenschap een zekere leeftijd of ouderdom bereikt, begint men ook na te denken over deze wetenschap zelf, en over haar nut. Dit is sinds een tiental jaren opvallend het geval voor de egyptologie. Vergeleken met vele andere wetenschappen, vooral met de exacte wetenschappen, is de egyptologie een relatief jonge wetenschap. Zelfs in de groep van de menswetenschappen zijn heel wat wetenschappen ouder. Het object van deze wetenschap, het oude Egypte, is oud, maar onze wetenschappelijke kennis van het faraonische Egypte heeft haar oorsprong slechts gevonden in de ontcijfering van het oudegyptische schrift door Jean-François Champollion [2]. Pas dan kregen we direct toegang tot de teksten in al hun verscheidenheid zoals historische en religieuze teksten, verhalen, gedichten, wetenschappelijke traktaten over wiskunde of geneeskunde, filosofische teksten en wijsheidsliteratuur, of juridische en economische teksten. Voorheen was onze informatie over Egypte beperkt tot wat de Bijbel [3] en de antieke schrijvers [4] erover vertelden.

Egyptosofie is maar een van de uitvloeisels van het nadenken van een wetenschap over zichzelf. En vermits deze wetenschap Egypte, en meer in het bijzonder het oude Egypte, als voorwerp heeft, en Egypte beschouwd wordt als „overzees”, heeft het spreken over egyptosofie in het kader van onze academie zin.

2. Waarom nu spreken we over egyptosofie?

Een eerste reden is dat dit woord nieuw of onbekend is. De vlijtigsten onder u zullen het wellicht opgezocht hebben in een paar woordenboeken of encyclopedieën. En zonder resultaat. Men verstaat het woord wel, maar de precieze betekenis heeft men niet. Ook op „Google” vindt men weinig. En de schaarse verwijzingen gaan praktisch alle terug naar een en hetzelfde artikel.

* De cijfers tussen haakjes [] verwijzen naar de noten, pp. 429-430.

Het artikel waarnaar verwezen wordt is een bijdrage aan een symposium over de heropleving van het oude Egypte in een aantal aspecten van het culturele leven, in de ruimste zin van het woord: kunst, gedachtegoed, het mysterieuze. In feite is de interesse voor het Egypte van de farao's ook vandaag nog groot: de reizen naar Egypte hebben veel succes, de TV-programma's die over Egypte handelen, worden druk bekeken.

Dit symposium werd van 9 tot 12 september 1993 in de buurt van Basel (in Augst) georganiseerd, met als titel: „Ägypten-Bilder”. De acta werden in 1997, tien jaar geleden dus, gepubliceerd [5].

3. Wie zijn de protagonisten?

De eerste protagonist is Erik Hornung zelf (° 1933), nu emeritus professor egyptologie van de Universiteit van Basel, in Zwitserland. Voorheen was hij professor aan de Universiteit van Münster, in Duitsland. Hij is wellicht de grootste levende kenner van de godsdienst van het oude Egypte. Het vaderschap van het woord „egyptosofie” komt hem toe. Dit wordt niet altijd erkend. Zo vinden we in de *Encyclopédie de la franc-maçonnerie*, Parijs, 2000, twee verwijzingen naar *égyptosophie*, telkens onder het lemma „Egypte”, maar de auteur citeert E. Hornung niet.

De tweede protagonist is een wat concurrerende Heidelbergse collega van Prof. Hornung, Jan Assmann (° 1938). Het is opvallend dat J. Assmann in zijn zeer degelijk boek *Die Zauberflöte. Oper und Mysterium*, München-Wenen, 2005, praktisch iedereen citeert, maar met geen woord rept over de gedachten en bijdragen van E. Hornung. J. Assmann tracht nochtans een egyptologische benadering te vinden in zijn uitleg over Mozarts *Zauberflöte*. Egyptologen zullen ook op dit punt maar gewone mensen zijn.

Er moet opgemerkt worden dat geen van beide egyptologen in de eerste plaats linguïst of filoloog is. Ze zijn vooral specialisten in de godsdienst van de Egyptenaren. Beiden hebben een grote filosofische en theologische bagage, en zijn zeer belesen. Het is op zijn minst verwonderlijk dat twee zeer grote egyptologen zich nu toespitsen op de egyptosofie, er seminaries over leiden, en dat dit voor hen een deel geworden is van het academische vak „egyptologie”.

4. Het onderscheid tussen egyptomanie en egyptosofie

Sommige mensen verwarren spontaan egyptomanie met egyptosofie. Dit is enigszins verstaanbaar omdat ze beide iets te maken hebben met het oude Egypte, maar het is verkeerd omdat ze beide wat anders willen zeggen. Het begrip egyptomanie heeft trouwens verwarring gezaaid.

Egyptomanie is, zoals het woord zelf zegt, een overdreven of ziekelijke belangstelling voor Egypte, althans zo doen de woordenboeken ons geloven [6], ofschoon zij het woord evenmin niet kennen. Wij baseren ons op de betekenis van manie in verbinding met het eerste lid. Persoonlijk vind ik dat er toch een onderscheid in graad van ziekelijkheid is tussen egyptomanie en kleptomanie of pyromanie.

Egyptomanie kunnen we definiëren als een verlangen, i.p.v. een drang, naar het imiteren van het oude Egypte, vooral in kunstvormen zoals de architectuur, maar niet exclusief. Het is onjuist te denken dat de egyptologen neerkijken op de egyptomanie. Ofschoon het voor hen als zodanig geen studieobject is, zijn de egyptologen wel nieuwsgierig te zien hoe het oude Egypte in de loop van de geschiedenis werd geïnterpreteerd.

Egyptomanie bestaat al sinds de oudheid. Keizer Augustus was een egyptomaan en de egyptomanie stond in het kader van zijn politiek. Hij wou tonen dat hij meester was van Egypte en daarom liet hij een tiental obeliskken van Egypte naar Rome overbrengen [7]. Dit maakt dat er in Rome meer Egyptische obeliskken staan dan in Egypte zelf. In de Renaissance werden die door de pausen verplaatst om de pelgrims te helpen bij het zoeken naar de belangrijkste kerken of basilieken die ze moesten bezoeken. Maar dit terzijde. De meest fameuze egyptomaan van de oudheid was keizer Hadrianus [8]. Ik vermeld kort zijn villa te Tivoli, bij Rome, met het gekende Canope, en zijn vriend Antinoös, die in de Nijl verdrong en nadien vergoddelijkt werd. Als geschenk kreeg hij trouwens zijn eigen obeliskje, dat nu op de Monte Pincio (Villa Borghese) staat in Rome [9].

Egyptosofie, zoals het verstaan wordt door E. Hornung en mezelf, is de wetenschap die zich bezighoudt met de Egyptische wijsheid of wat daarvoor wordt aanzien. Dit laatste is een belangrijke toevoeging.

We hebben in de definitie dus twee elementen, die we even nader gaan bekijken.

4.1. EGYPTISCHE WIJSHEID

De oudegyptische wijsheid is een praktische wijsheid die we kennen in de vorm van „Lebenslehren” zoals men het zo goed en beknopt zegt in het Duits. Andere talen vinden er een andere uitdrukking voor: in het Engels „Instructions for Life”, of „des enseignements pour la vie” in het Frans. Het Nederlands zou kunnen opteren voor „onderrichtingen voor het leven”. Het zijn praktische onderrichtingen of raadgevingen om succesvol door het leven te gaan. Meestal dragen ze de naam van de fictieve vader of leermeester die de leerling onderwijst. In bloemlezingen, die in zowat alle westerse talen bestaan, vindt men in vertaling veel van die „Lebenslehren” terug.

4.2. WAT WORDT AANZIEN ALS EGYPTISCHE WIJSHEID?

Egyptosofie is meer dan de studie van de traditionele wijsheid van het oude Egypte. Dit is o.m. de taak van de egyptologie. Worden aanzien als Egyptische wijsheid:

- De Egyptische wijsheid met haar reputatie in het oude Nabije Oosten. We beperken ons hier tot het meest gekende voorbeeld, namelijk de legendarische wijsheid van koning Salomon (Xde eeuw vóór Christus). Zijn wijsheid wordt vergeleken met die van de Egyptenaren. Salomon was nog veel wijzer [10].
- De ontmoeting van die wijsheid van Egypte met het oude Nabije Oosten (vooral dan de Hebreeuwse wereld) en de Griekse cultuur. Het is natuurlijk niet alleen de geschiedenis van Salomon die ons inlichtingen geeft. Naast het feit dat Salomon ook als schoonvader een farao had [11], zijn hele stukken van wat de christenen het Oude Testament noemen geredigeerd. In het *Boek der Spreuken* zijn zomaar klakkeloos dertig hoofdstukken [12] (niet te vergelijken met wat wij nu onder een hoofdstuk verstaan, hoofdstukken bestonden vaak maar uit een paar zinnen). Koning Salomon zou in zekere zin als de eerste egyptosoof kunnen beschouwd worden. De tweede historische figuur, die we ook de vader van de geschiedschrijving noemen, is Herodotus (Vde eeuw vóór Christus). In zijn kielzog is een hele schare Griekse filosofen naar Egypte getrokken, letterlijk of figuurlijk, op zoek naar wijsheid.

De egyptosofie is met andere woorden kunnen uitleven in een confrontatie, een ontmoeting van deze verschillende culturele componenten. Robert Amadou in de *Encyclopédie de la franc-maçonnerie* spreekt over egyptosofie onder het lemma „Egypte” en zegt: „Tout l’Occident, depuis Athènes, s’est engoué de l’Egypte. Egyptologie ou égyptomanie? Il faut le surmonter avec l’égypptosophie. L’égypptosophie embrasse l’Egypte pharaonique” [13]. We willen dit even nuanceren. Egyptosofie is geen dwepen met het oude Egypte. Egyptosofie is een wetenschap, en geen ideologie. In die zin zijn wij een andere mening toegedaan, voor wat betreft de egyptosofie.

5. Egyptosofie veronderstelt geen egyptologie

U zult reeds gemerkt hebben dat egyptosofen geen egyptologen zijn. In feite veronderstelt de egyptosofie geen kennis van de egyptologie.

Egyptosofie heeft voor ons weinig te maken met het faraonische Egypte. Daarmee bedoel ik dat het weinig te maken heeft met de grammaticale analyses van de taal, de studie van de grammatica, de archeologie of zelfs de geschiedenis. Ik geef een paar voorbeelden.

Het eerste voorbeeld is Athanasius Kircher (1602-1680). Een Duits jezuïet, die professor was in Rome aan het *Collegium Romanum*, de voorloper van de

Gregoriaanse Universiteit. In de egyptologie wordt hij vaak als een charlatan voorgesteld omdat hij beweerde de hiërogliefen te kunnen lezen. Zijn vergissing was dat hij dacht over alle gegevens te beschikken, wat niet waar was. Maar hij heeft wel in zijn publicaties de aandacht getrokken op het oude Egypte en hij mag beschouwd worden als een groot egyptosoof.

Het tweede voorbeeld is *Die Zauberflöte* (uit 1791) van W. A. Mozart. Dit is misschien het beste en meest gekende voorbeeld van egyptosofie en illustreert wonderwel wat we onder egyptosofie verstaan.

Het gehele verhaal speelt zich af in een imaginair Egypte. In een niet nader te bepalen periode, m.a.w. in een Egypte dat niet bestaat en dat nooit heeft bestaan. *Die Zauberflöte* is geschreven en gecomponeerd in een tijd waarin we nog geen wetenschappelijke kennis hadden van Egypte. De enige bronnen waren de Bijbel en de klassieke auteurs. Het hiërogliefenschrift was nog niet ontcijferd.

In *die Zauberflöte* wordt de wijsheid van Egypte geprezen en Egypte werd aanzien als het land waaruit alle wijsheid komt. De meesten onder U zullen wel weten dat Wolfgang en Leopold Mozart tot de Weense vrijmetselaarsloge *Zur Wahren Eintracht* behoorden en daar lezingen over de pyramiden en legenden uit Egypte hebben bijgewoond. Deze werden gegeven door Anton Kreil, een filosoof en klassiek filoloog [14].

Een ander werk met Egypte als onderwerp is *Aida* van G. Verdi. Dit is een egyptomanische opera, waarvan het libretto geschreven werd door een egyptoloog, namelijk Auguste Mariette (1821-1881). De opera ging in première op 24 december 1871 in Caïro bij gelegenheid van de opening van het Suezkanaal.

In het volgende schema ziet U in welke verhouding de egyptosofie staat tot de egyptologie [15] en de egyptomanie.

EGYPTOLOGIE — EGYPTOMANIE — EGYPTOSOFIE



6. Egyptosofie: ideologie of wetenschap?

Uit het schema zult U kunnen afgeleid hebben dat egyptosofie en egyptologie aan dezelfde kant staan. Ze zijn familie van elkaar en, zoals dit in meerdere families het geval is, is de relatie tussen de verwanten niet altijd goed.

De egyptomanie zoals wij die nu kennen is één van de gevolgen geweest van de „Expédition de l’Égypte” van Napoleon. Die „Expédition de l’Égypte” was een wetenschappelijke en ideologische onderneming [16]. De egyptomanie die erop volgde was de uitdrukking van dat ideologische, zoals ik reeds gezegd heb in het begin van deze mededeling.

Velen staan argwanig tegenover de egyptosofie. Nochtans zouden egyptologen en egyptosofen veel van elkaar kunnen leren. De egyptosoof interesseert zich voor het esoterische karakter van het oude Egypte, maar hij doet dit als wetenschapper.

We kunnen besluiten dat egyptosofie een wetenschap is en geen ideologie, maar we weten eveneens dat hierover het laatste woord niet is gezegd. Egyptosofie is een voorwerp van studie, het heeft een wetenschappelijk onderwerp en de studiemethode is een wetenschappelijke methode. Het is om deze reden te betreuren dat aan onze universiteiten leerstoelen in esoterisme ontbreken, vooral in deze tijden waar de mensen teruggrijpen naar de diepere zin van dingen en gebeurtenissen.

NOTEN

- [1] De eerste uitgave van de *Imprimerie Impériale* begon reeds in 1809 om te eindigen in 1818. Het geheel bestond uit 23 boekdelen. Vanaf 1821 tot 1826 werd een tweede uitgave (*Imprimerie Royale*) verzorgd in 37 boekdelen; deze uitgave wordt gewoonlijk die van Panckoucke genoemd omwille van de uitgever Charles Panckoucke.
- [2] Gewoonlijk wordt het jaar 1822 aangenomen, omwille van de *Lettre à M. Dacier relative à l’alphabet des hiéroglyphes phonétique* (Parijs).
- [3] In de gehele christelijke bijbel, Oud en Nieuw Testament, wordt Egypte 753 keer vermeld; het woord „faraon” 277 keer, zonder de individuele faraon’s op te sommen. Zie O. Odelain & R. Séguineau, *Dictionnaire des noms propres de la Bible* (Parijs, 1978).
- [4] De meest geciteerde is Herodotus. Het tweede boek van zijn *Historiën* is uitsluitend gewijd aan Egypte. Zie A. B. Lloyd, *Herodotus Book II* (Leiden, 1975-1988). Een andere, minder betrouwbare maar vaak gebruikte bron was Plutarchus, *De Iside et Osiride*. Voor deze laatste zie J. G. Griffiths, *Plutarch’s De Iside et Osiride* (Swansea, 1970).
- [5] E. Hornung, „*Hermetische Weisheit: Umriss einer Agyptosophie*”, in E. Staehelin & B. Jaeger (Hrsg.), *Agypten-Bilder. Akten des „Symposiums zur Agypten-Rezeption”* (August bei Basel vom 9-11 September 1993), Fribourg (Zwitserland) / Göttingen, Orbis Biblicus et Orientalis [OBO], 150, 1997, blz. 333-342.

- [6] Van Dale, II, Utrecht-Antwerpen, 2005, blz. 2075: „als tweede lid in samengestelde z.n. die een overdreven of ziekelijke belangstelling noemen voor wat het eerste lid aanduidt”.
- [7] E. Iversen, *Obelisks in Exile. The Obelisks of Rome* (vol. I), Kopenhagen, 1968.
- [8] Keizer van 117-138 na Christus.
- [9] E. Iversen, *op. cit.*, 161-173.
- [10] 1 Kg, 5: 9-14.
- [11] Sheshonq I of Shishaq, zoals vermeld in de Bijbel.
- [12] Spr. 22: 17-29; 23: 1-35.
- [13] *Encyclopédie de la franc-maçonnerie* (sous la direction de E. Saunier), Parijs, 2000, p. 244.
- [14] [A. Kreil], „Über die wissenschaftliche Maurerey”, in *Journal für Freymaurer*, 7 (1785): 49-78.
- [15] De egyptologie is familie van de egyptosofie, die ze chronologisch voorafgaat. Met de ontcijfering van de hiërogliefen in 1822 door J.-F. Champollion begint de wetenschappelijke egyptologie.
- [16] H. Laurens, *L'expédition d'Égypte 1798-1801* (Parijs, 1997, p. 469).

Soil Salinization and Dental Fluorosis as a Result of Water Use in Zambia*

by

Eric VAN RANST **, Victor SHITUMBANUMA ***,
Francis TEMBO **** & Florias MEES *****

KEYWORDS. — Soil Salinization; Soluble Salts; Water Use; Hot Springs; Dental Fluorosis; Zambia.

SUMMARY. — Availability of water for agricultural and domestic use is a common problem in the drier part of Zambia (Southern Province), particularly in the hot dry months of August-October. During these dry periods when most seasonal water sources dry up, people depend on water from rivers or from deep wells. Irrigation of crops, needed in the dry season, often results in the accumulation of salts on the cultivated fields, inducing water stress, soil structure deterioration and compaction, and transforming large tracts of productive land into barren unproductive areas. In locations with hot springs, residents use water from the springs for their domestic requirements, livestock and irrigation of crops. The high prevalence of mottled teeth among residents is a case of endemic dental fluorosis associated with drinking water from hot springs containing concentrations of fluoride in excess of the World Health Organization (WHO) maximum guideline value. Children of small farmers are the main victims.

TREFWOORDEN. — Bodemverziltig; Oplosbare zouten; Watergebruik; Warmwaterbronnen; Tandfluorose; Zambia.

SAMENVATTING. — *Bodemverziltig en tandfluorose ten gevolge van watergebruik in Zambia.* — Beschikbaarheid van water voor landbouwkundig en huishoudelijk gebruik is vooral in de hete en droge maanden van augustus tot oktober een algemeen probleem in het drogere landsdeel van Zambia (*Southern Province*). Wanneer de seizoengebonden waterbronnen opdrogen, zijn de mensen voor hun watervoorziening afhankelijk van rivie-

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** Director of the Section of Natural and Medical Sciences; Department of Geology and Soil Science (WE13), Laboratory of Soil Science, Ghent University, Krijgslaan 281/S8, B-9000 Ghent (Belgium).

*** Department of Soil Science, School of Agricultural Sciences, University of Zambia, 32379 Lusaka (Zambia).

**** Department of Geology, School of Mines, University of Zambia, 32379 Lusaka (Zambia).

***** Department of Geology and Mineralogy, Royal Museum for Central Africa, Leuvensesteenweg 13, B-3080 Tervuren (Belgium).

ren en diepe bronnen. Gewasirrigatie in het droogseizoen resulteert vaak in zoutafzetting op de velden met als gevolg problemen van wateropname door de gewassen, bodemstructuurverval en bodemcompactie, waarbij grote delen van het productieve land getransformeerd worden in dor, onproductief terrein. Waar warmwaterbronnen voorkomen, worden ook deze door de lokale bevolking gebruikt in het huishouden, als drinkwater voor het vee, en als irrigatiewater voor gewassen. Het veelvuldig voorkomen van gevlekte tanden bij deze inwoners is een geval van endemische tandfluorose, geassocieerd met het drinken van water uit de heetwaterbronnen waarvan de fluorideconcentraties de maximumwaarde van de richtlijn van de Wereldgezondheidsorganisatie overschrijden. Kinderen van kleinschalige boeren zijn de belangrijkste slachtoffers.

MOTS-CLES. — Salinisation du sol; Sels solubles; Utilisation de l'eau; Sources thermales; Fluorose dentaire; Zambie.

RESUME. — *Salinisation du sol et fluorose dentaire résultant de l'utilisation de l'eau en Zambie.* — La disponibilité en eau pour les usages agricoles et domestiques est un problème commun dans la partie la plus sèche de la Zambie (*Southern Province*), particulièrement durant les mois chauds et secs (août-octobre). Durant ces périodes sèches où la plupart des sources d'eau saisonnières s'assèchent, les populations dépendent de l'eau des rivières ou des puits profonds. L'irrigation des cultures, indispensable en saison sèche, provoque souvent une accumulation de sels sur les champs de culture, induisant un stress hydrique, une détérioration de la structure du sol et une compaction. Ces processus transforment de vastes terres fertiles en terres stériles. Aux abords des sources thermales, les populations résidentes utilisent l'eau de ces sources pour leurs besoins domestiques, le bétail et l'irrigation des cultures. La fréquence élevée des dents colorées parmi les résidents est un cas de fluorose dentaire endémique associée à la consommation d'eau provenant de sources thermales. Celle-ci contient une concentration en fluorure excédant la valeur limite instituée par l'Organisation Mondiale de la Santé (OMS). Les enfants des petits fermiers en sont les principales victimes.

1. Introduction

The goal of every country in Africa is to seek self-sufficiency in food and fibre production. Lacking the technology and the ability to respond to problems, many countries are faced with the hazards of drought, soil degradation and low productivity. Water resources and water availability in Zambia have been previously discussed by SHARMA (1985) and the Japanese International Cooperation Agency (JICA 1992). Zambia may have substantial surface and groundwater resources, but the water is largely not in the form and quantity required by the Zambian population (eight million people) for domestic, industrial and agricultural purposes (CHABWELA & MUMBA 1998). The quality of water remains one of the most pressing issues in the country. Much of the population in Zambia is exposed to contaminated water and major waterborne diseases, such as cholera and schistosomiasis (or bilharzias), are endemic. More than 60 % of the population is rural and depends directly on the natural environment. As much as 48.4 % of this rural population takes water from streams, lakes, ponds or springs

(GAISSIE *et al.* 1992). A second aspect is the location of Zambia in a region of extreme seasonal and climatic variations and with recurrent droughts. The main source of water in Zambia is rainfall, since underground sources are not well explored. Rainfall in Zambia averages between 1,100 and 1,400 mm, with the highest rainfall within this range confined to the northern part of the country. The problem of droughts is discussed by TIFFEN & MULELE (1993). Between 1981 and 1990, some parts of Zambia received less than 700 mm of rainfall. In general the rainy season is short (see below). Rainfall is quite erratic and poorly distributed, and the risk of water stress is prevalent in the southern half of the country. Furthermore, rapid population growth and rising consumption at the backdrop of poor economic performance are leading to the over-harvesting of natural resources and the pollution of air, water and land (SAKALA *et al.* 2006).

This paper discusses two case studies, illustrating some undesired effects of the use of water from rivers and springs on soil quality and human health in the Southern Province, the drier part of Zambia (fig. 1). In this region, the availability of water for agricultural and domestic use is a persistent problem. Freshwater supplies are not sufficient to meet crop requirements and during the dry spells people depend on water from rivers and from deep wells. Emphasis in this paper is given to the characterization of the evaporite minerals formed during soil salinization and the relationship between sources of drinking water and the incidence of dental fluorosis.

2. Case Studies

2.1. WATER FROM THE KAFUE RIVER FOR THE IRRIGATION OF THE NAKAMBALA SUGAR ESTATE

2.1.1. *Environmental Setting*

The Nakambala Sugar Estate is situated near Mazabuka in the Southern Province. The Estate has experienced several periods of expansion and had a nominal capacity of over 140,000 tonnes of sugar per year in the beginning of the 1990s with some 10,000 hectares under cane cultivation, excluding the areas worked by the many smallholders. Some 22,000 people live at Nakambala Estate (Census 1993) and it is estimated that a further 10,000 people who live outside Nakambala, derive their livelihoods from the estate.

The climate of the area (fig. 2) is characterized by a dry period of more than 200 days. Irrigation is therefore needed for the cultivation of sugarcane, particularly during the hot and dry months of August to October. The rainy season normally begins in November and tapers off at the end of March. In accordance with local practice, the entire period of the dry season is referred to as the irrigation season. With weekly irrigation and high temperatures, the growing rate of sugarcane is fast. As these plants have a tremendous water consumption, operations

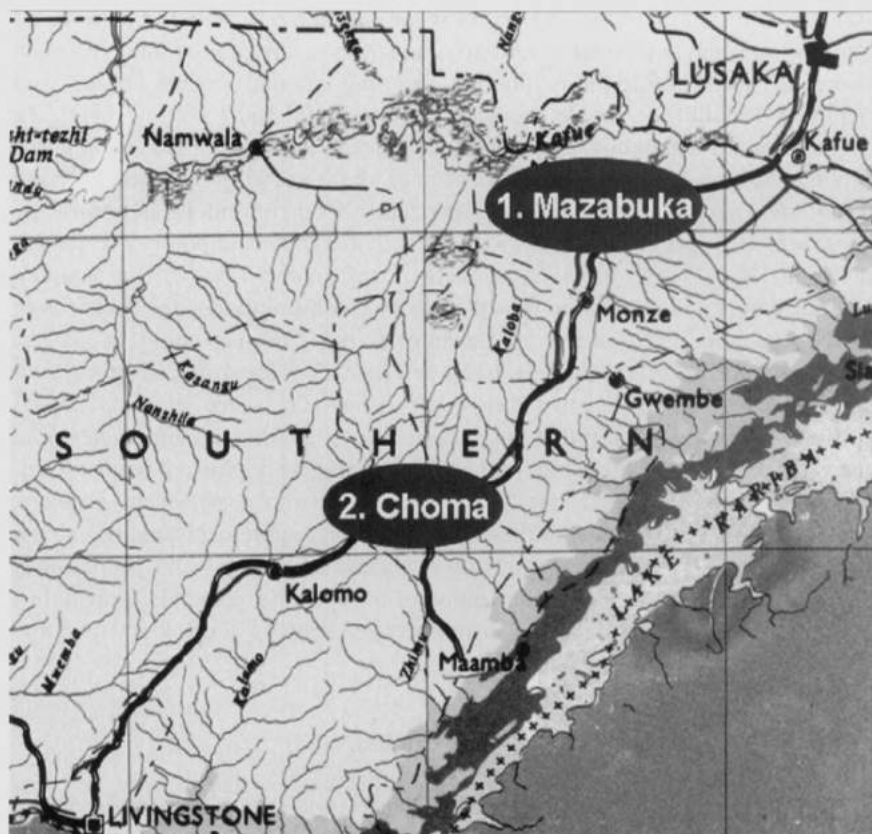


Fig. 1. — Location of the two selected case studies in the Southern Province.

throughout the estate are conducted on a requirement of 2,030 mm of water a year, the 1,270 mm shortfall in an average annual rainfall being made up through the irrigation system.

The water supply is drawn from the Kafue River at a point several kilometres from the cane fields. A canal has been cut from the river to the estate's No. 1 pump station. This station, equipped with Australian-made low-lift pumps, is capable of taking about 170,000 litres a minute from the river, lifting the water 6 m and feeding a 6.5 km-long supply canal. At the end of this gravity-flow canal is a second high-lift pump station which is used to transfer the water into a main pipeline some 8 km in length both for direct irrigation and the filling of storage basins. Shortly after dawn each day, irrigation teams move into the sugarcane fields, the water is released from the storage basins and in dozens of different places the water is applied along furrows between the ridges where sugarcane is grown.

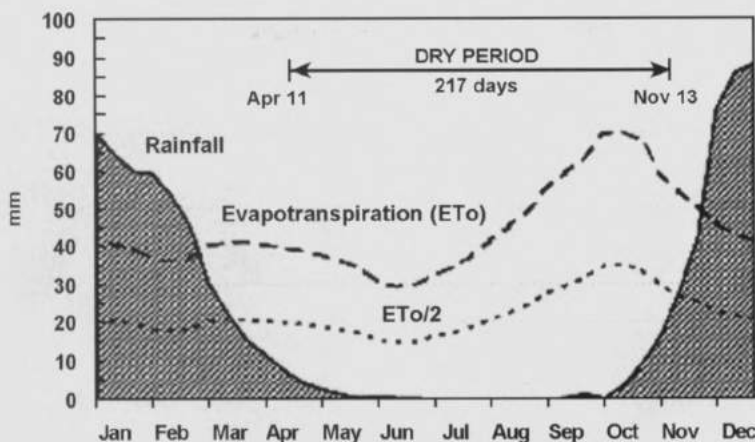


Fig. 2. — Climatic characteristics at Mazabuka (elevation: 987 m A.S.L.; location: 15°46'0"S, 27°55'0"E).

2.1.2. Soil Salinization and Characterization of Salts

Irrigation, needed during the dry season, often results in the accumulation of salts on the surface of the soils in sugarcane fields and along edges of drainage ditches in the fields close to the Kafue River. Sugarcane plants growing on salt-affected soils appear less healthy than those growing on non salt-affected soils. Some areas in the plantation were so strongly affected that almost no sugarcane could grow there. The salts or evaporite minerals accumulated on the surface of the sugarcane fields occur predominantly as white to brownish ash-like powdery material, with a thickness of 1 to 4 cm. Whitish to transparent hard glass-like salt crusts cover and seal the soil surface along the edges of the irrigation drains. The glass-like crusts are covered with white loose powdery salts similar to those present on the surface of sugarcane fields. In the furrows adjacent to the ridges where growth of sugarcane failed, the clayey soil is often heavily cracked.

Samples of both the glass-like and the loose powdery crusts, collected in clean polyethylene bags, were analyzed using X-Ray Diffraction (XRD), Scanning Electron Microscopy (SEM), and Energy Dispersive Spectroscopy (EDS). The dominant salt mineral in the powdery and glass-like crusts is thenardite (Na_2SO_4), confirmed by XRD and EDS analyses. Both typical crystal forms of thenardite occur, *i.e.* needle-shaped and bipyramidal, shown in the SEM images in figure 3. The powdery crusts consist predominantly of needle-shaped thenardite, compatible with the loose structure and consistency observed in the field. The glass-like salt crusts from the edges of the irrigation drains contain bloedite [$\text{Na}_2\text{Mg}(\text{SO}_4)_2 \cdot 4\text{H}_2\text{O}$], besides thenardite. SEM images (fig. 4) show interlocking stacked crystals of bloedite, resulting in a great hardness and coher-

ence of the crusts, as observed in the field. The thenardite crystals in the glass-like crusts are bipyramidal unlike those in the powdery crusts.

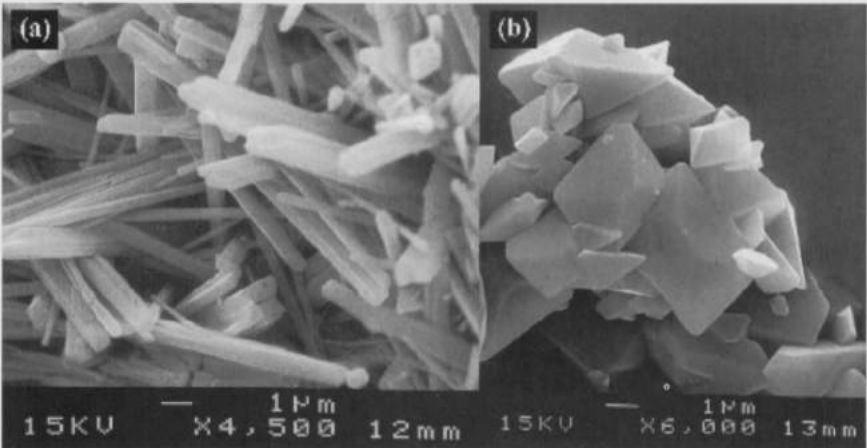


Fig. 3. — Scanning Electron Micrographs (SEM) of the typical crystal forms of thenardite: (a) needle shaped and (b) bipyramidal.

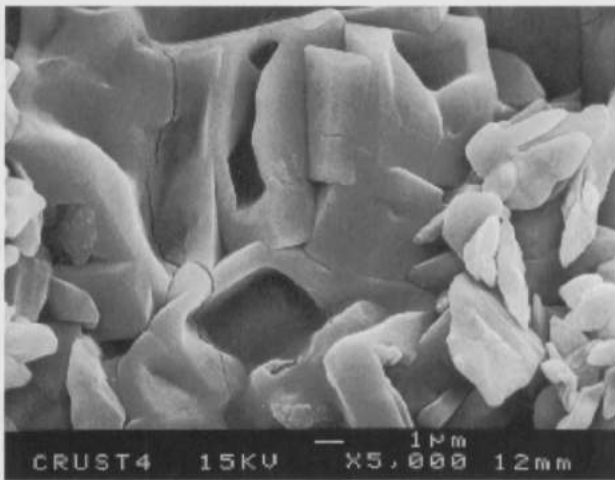


Fig. 4. — Scanning Electron Micrograph (SEM) showing interlocking crystals of bloedite.

The minerals identified in the salt crusts are typical of some inland salt accumulations described in the literature. They can form when calcium-poor water containing significant amounts of sulphate, magnesium and sodium ions evaporate.

orates at the soil surface in areas with high groundwater levels. Thenardite commonly forms by dehydration of mirabilite ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$), but there are no indications that surface occurrences in the study area are derived from a mirabilite precursor.

2.1.3. *Impact on Soil Quality and Crop Productivity*

The presence of evaporite minerals is an expression of high salinity levels in the soil. Under those conditions, the osmotic potential of the water in the soil is bound to be high enough to significantly reduce the availability of water to crops, to the extent that yields may be measurably reduced. Since sugarcane is moderately sensitive to salinity, it is likely that sugarcane grown on salt-affected soils yields much lower than that grown on non-salt-affected soils. According to HOFFMAN *et al.* (1993), the threshold level of salinity (*i.e.* the maximum salinity above which yield reduction occurs) is 1.7 dS/cm for sugarcane, and the predicted yield reduction per unit of salinity above the threshold is 5.9 %. This threshold value is greatly exceeded in the studied salt-affected soils, inducing significant reductions in the yields of the sugarcane. Besides reduced availability of water as a major cause of yield reduction, high salinity also has other undesired effects. One example is the poisoning of plants by excess concentrations of certain ion species. Another effect is the development of unfavourable soil physical conditions, in the form of structure deterioration, aggregate failure, and compaction. Excessive saturation of exchange capacity with sodium provokes clay deflocculating and consequently destruction of the soil structure which, with low permeability conditions, may become irreversible. Surface occurrences of salts, especially those with a loose consistency such as those in the sugarcane fields, can be deflated by wind, causing soil salinization in larger areas than those with high groundwater levels.

Efforts are urgently needed to redress the current accumulation of salts on cultivated fields, otherwise large tracts of land will become unproductive. Allowing the accumulation of salts on sugarcane fields to continue is bound to be detrimental to the long-term productivity of vast areas. It is also bound to degrade the environment where such accumulations occur. Therefore a need exists to seriously address the problem of soil salinity if sustainable and profitable production of sugarcane at Nakambala is to be maintained.

2.2. WATER FROM HOT SPRINGS IN CHOMA DISTRICT FOR IRRIGATION, DOMESTIC USE AND LIVESTOCK

2.2.1. *Environmental Setting*

The Choma District is located on the Southern Plateau of Zambia, which is part of the Central African Plateau, a generally flat to gently undulating region at an elevation of 1,200 m above sea level (DALAL-CLAYTON *et al.* 1985). The area

sits astride the main watershed that separates the catchment areas of the Zambezi River to the south and the Kafue River to the north. Much of the Choma District is underlain by granite that is part of the large granitoid mass known as the Choma-Kalomo batholith, which extends for several tens of kilometres between the Choma and Kalomo Districts (NEWTON 1963).

The climate in the area is similar to that of other parts of southern Zambia, implying important water deficits during the dry season (fig. 5). As described below, the region has many hot springs, whose water is used during dry periods for domestic requirements, livestock and irrigating crops (fig. 6).

The study area and its surrounding environment are sparsely populated. With the exception of the few locations with human dwellings, most of the area is under the natural Miombo woodland that characterizes much of the plateau region of Zambia. The majority of the residents in the study area are workers on commercial tobacco farms and ranches, while others are small-scale farmers, engaged in growing maize or raising cattle. The main products of the larger farms are cattle, tobacco, maize and wheat. The smaller or subsistence farms keep cattle, goats and pigs and grow maize, cotton and sunflowers. Small vegetable gardens are common along the river banks.

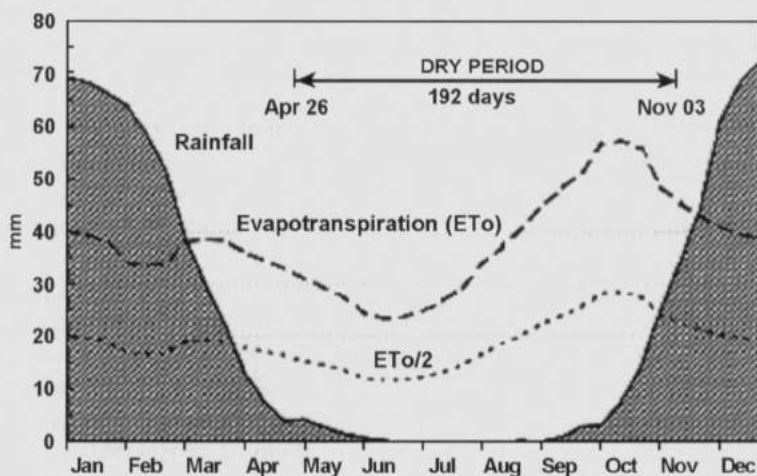


Fig. 5. — Climatic characteristics at Choma (elevation: 1,267 m A.S.L.; location: 16°51'0"S, 27°4'0"E).

2.2.2. Geology of Hot Spring Areas and Fluoride Concentrations in Water Sources

All the hot springs, up to five per hectare, in the Choma District are located at edges of gently sloping ridges which separate shallow, broad valleys that char-



Fig. 6. — A hot spring in the Choma District.

acterize the drainage pattern in the area. In all areas investigated, the hot springs are located along faults that were identified using both satellite imagery and field observations. In the field, the presence of faults is indicated by the presence of fault breccia, silicification and shearing of the granite. Figure 7 shows the location of the hot springs in relation to the geological structure and occurrence of faults in the study area. The hot springs emanate from faults within granitic rocks that make up the Choma-Kalomo batholith. Petrographic and XRD analyses show that the medium- to coarse-grained porphyritic granites contain sodic plagioclase, microcline, quartz, biotite and hornblende, as well as accessory epidote and fluorine-bearing minerals (fluorapatite). Biotite and hornblende are other possible sources of fluorine in rocks (WEDEPOHL 1974). The surface of rock outcrops close to the hot springs appear whitish due to alteration of the feldspars.

Water samples from different sources (hot springs, boreholes and shallow wells), collected in triplicate in polyethylene bottles, were analysed for fluoride concentration using an ion-selective electrode and for other drinking water quality parameters following standard methods (CLESCERI *et al.* 1998). The concentration of fluoride in water samples from hot springs was significantly ($P < 0.0001$) higher than in samples from other sources, with mean values of 6.56 mg/l for hot springs and 0.15 mg/l for other water sources. The study area

is a rural district with no industrial activity that could possibly serve as an anthropogenic source of fluoride. The temperature of water from hot springs measured in the field using a portable multi-parameter analyser (pH, EC, temperature), ranged from 28.2 to 70.6 °C, whereas that of samples collected from other sources ranged from 24.0 to 26.6 °C. In general, water with higher temperatures contained higher fluoride concentrations than water with lower temperatures. There was, however, no statistically significant relationship between water temperature and the concentration of fluoride. The range of fluoride concentrations of water samples from hot springs and from other sources is shown in figure 8. Concentrations of fluoride in water from hot springs are significantly higher ($P = 0.001$) than those in water from other sources and also significantly higher than the World Health Organization (WHO 1996) guideline value for fluoride in drinking water (1.5 mg/l).

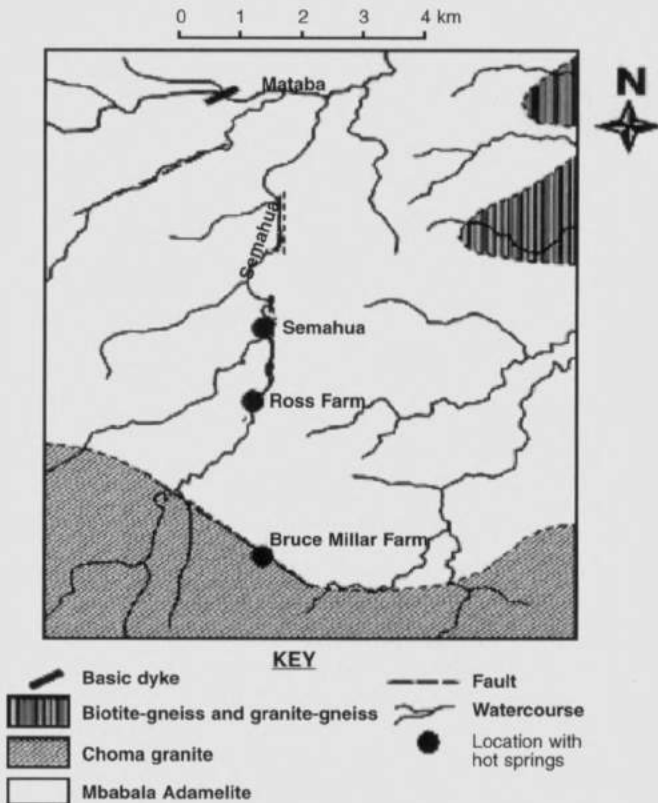


Fig. 7. — Location of hot springs in relation to the geology and occurrence of faults in the Choma study area.

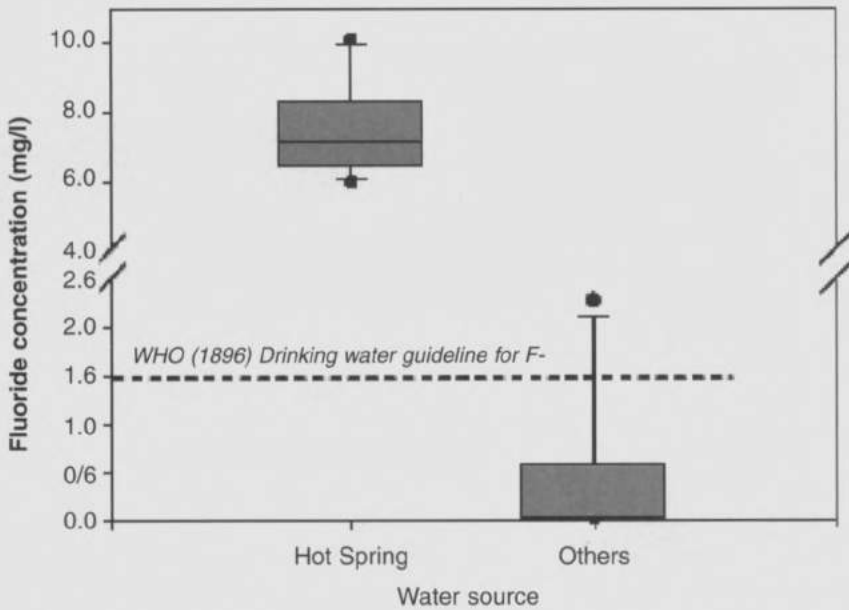


Fig. 8. — Fluoride concentrations in water from hot springs and other drinking water sources in Choma District.

2.2.3. Soil Salinization and Characterization of Salts

In the Choma District, water from hot springs and other water sources is collected in a kind of reservoir for use during the dry period. Farmers have constructed irrigation canals to carry the water from the reservoir to the cultivated fields (fig. 9). The residents and peasant farmers use water from hot springs for the irrigation of their crops, which often results in soil degradation due to the accumulation of salts. These salts have been studied by using different techniques, *e.g.* XRD, SEM and EDS. All salts identified are highly soluble sodium salts (tab. 1). Interesting and new for Zambia was the positive identification of kogarkoite ($\text{Na}_3\text{SO}_4\text{F}$). SEM images illustrating the shape of the kogarkoite crystals found in Choma District are given in figure 10; EDS analysis provided additional evidence for the identification of these crystals as kogarkoite (fig. 11).

Kogarkoite is named after L. N. Kogarko, who was the first to refer to a natural occurrence of $\text{Na}_3\text{SO}_4\text{F}$, found in a nepheline syenite pegmatite of the Kola Peninsula (KOGARKO 1961, PABST & SHARP 1973). Kogarkoite was first studied and described as a new mineral in a hot spring area in central Colorado, as part of opal-rich deposits that form from steam around vents. Water from one of the hot springs with associated kogarkoite has a fluoride concentration of 13 ppm (SHARP 1970). In earth-surface conditions unrelated to hot spring environments,

kogarkoite has been identified in salt deposits of Lake Natron, Tanzania (DARRAGI *et al.* 1983, NIELSEN 1999), and as part of salt efflorescences on soils in northern Tanzania (NIELSEN 1999).



Fig. 9. — Irrigation canals constructed to carry the water from reservoir to cultivated fields.

Table 1

Easily water-soluble salts identified by XRD, SEM and EDS

Thenardite	: Na_2SO_4
Kogarkoite	: $\text{Na}_2\text{SO}_4\text{F}$
Trona	: $\text{Na}_2\text{H}(\text{CO}_3)_2 \cdot 2\text{H}_2\text{O}$
Thermonatrite	: $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
Halite	: NaCl

2.2.4. Dental Fluorosis

Besides being used for irrigation, the water of the hot springs is also collected for livestock and domestic use. The area in the Choma District has a high incidence of people, mainly children of farm workers and peasant farmers, with mottled and discoloured teeth, indicating dental fluorosis (fig. 12). The most likely sources of fluoride for the residents of this area are the water they drink and the food they eat. Because the majority of the children cannot afford tooth-

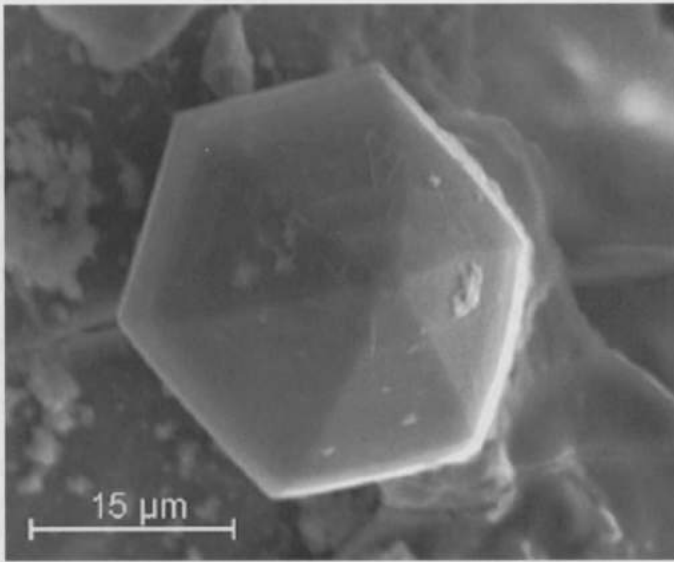


Fig. 10. — Scanning Electron Micrograph (SEM) of kogarkoite.

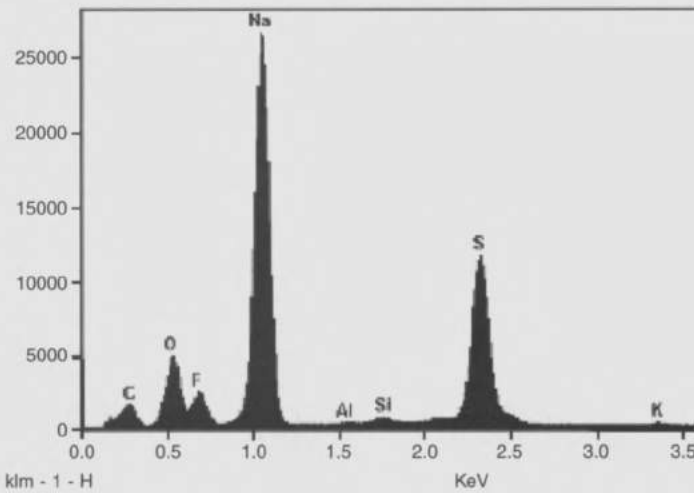


Fig. 11. — Energy Dispersive Spectroscopic (EDS) analysis showing the presence of kogarkoite.

paste, and therefore generally do not use it, fluoridated dental products are not likely to be significant sources of fluoride in this population. There is no fluoridation of water in Zambia, so the consumption of municipally fluoridated water cannot be considered a possible source of fluoride either.

To test whether there was an association between the incidence of discoloured teeth among pupils and main sources of drinking water, SHITUMBANUMA *et al.* (2007) used a chi-squared test to analyse the data obtained from a survey, including a physical examination of the teeth of one hundred and twenty-eight school children carried out at the Choma General Hospital. Their results, presented in table 2, show that all thirty-seven pupils (100 %) who drank water from hot springs during the period of formation of their permanent teeth had clinical symptoms associated with dental fluorosis, while only three of the ninety-one pupils (3.3 %) who drank water from other sources had these symptoms. The lambda values for the chi-squared test indicated that knowledge of a pupil's source of drinking water between birth and age 7 reduced the error in predicting whether a pupil has dental fluorosis or not by more than 90 %.

Although dental fluorosis is not very common and not well documented in Zambia, SHITUMBANUMA *et al.* (2007) have shown that the high incidence of discoloured teeth among the residents of the area of the Choma District with its hot springs is strongly associated with the drinking of water from hot springs that contain high levels of fluoride. Not only children but also dairy cows in the area have teeth that are worn out due to drinking water from hot springs and they are unable to chew the grass properly.

Problems related to high fluor contents in water have been reported for other parts of Africa, such as the East African Rift in Ethiopia. Hot springs are a common source of fluoride, as in the Choma District. The contribution of fluor-bearing minerals in the granite bedrock to high fluoride levels in the spring water is uncertain.



Fig. 12. — Children of small farmers with mottled and discoloured teeth.

Table 2

Occurrence of dental fluorosis among pupils in relation to their main source of drinking water between birth and age 7 in the study area

Water source	Clinical symptoms of dental fluorosis		
	Absent (%)	Present (%)	Total
Other (non-hot spring)	88 (96.7)	3 (3.3)	91
Hot spring	0 (0)	37 (100)	37
Total	88 (68.75)	40 (31.25)	128

3. Conclusions and Recommendations for Future Research

The case studies have clearly demonstrated (1) that soil irrigation in the Southern Province of Zambia often results in accumulation of salts and consequently a decline of soil quality and crop productivity, and (2) that the prevalence of mottled teeth of residents of areas with hot springs is a case of endemic dental fluorosis associated with the drinking of water with high concentrations of fluoride.

Future research and other activities should concentrate on (1) implementation of improved irrigation practices to avoid salinization, (2) raising local public awareness about the use of water from hot springs, and (3) possible development of desalinization and defluoridation procedures using local amendments based on field and laboratory experiments.

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Crisis Response or Disaster Relief Management*

by

Christian DE MEYER**

KEYWORDS. — Crisis; Response; Relief Management; ICT Systems; Sahana; FOSS; Communication.

SUMMARY. — In the aftermath of a terrible natural disaster like the December 2004 tsunami in South-East Asia, many organizations from all over the world were willing to rescue and help the affected countries. A lot of reliable information and better communication are the key for efficient response. In Sri Lanka, for instance, one of the most affected countries by the tsunami, one came to noting that no software was available anywhere to collect and distribute in a structured way information about injured and missing people. Hence ICT volunteers put together the “Sahana Disaster Management System” to help track families and coordinate work among relief organizations during and after the tsunami disaster. Sahana is developed on a “Free Open Source Software platform” (FOSS) and is made available as FOSS itself. A major advantage of having a FOSS disaster management system is that it can be readily distributed, localized and customized according to the requirements of the region or community using it. Poor countries can afford to use it as well.

TREFWOORDEN. — Ramp; Beheer; Hulpverlening; IT systeem; Sahana; FOSS; Communicatie.

SAMENVATTING. — *Beheer van hulpverlening bij rampen.* — Na de vreselijke natuurramp ten gevolge van de tsunami in december 2004 in Zuid-Oost-Azië, waren verschillende organisaties over de hele wereld klaar om hulp te bieden in de getroffen gebieden. Veel en betrouwbare informatie en communicatie was noodzakkelijk om de hulpverlening efficiënt te doen verlopen. In Sri Lanka bijvoorbeeld, één van de meest getroffen gebieden, werd vastgesteld dat er geen kant-en-klare software bestond om gegevens over slachtoffers en vermiste personen te verzamelen en te verdelen. Vandaar dat een team IT-vrijwilligers het

* Lecture given at the Academic Opening Session held on 18 October 2007. Text received on 10 September 2008.

** Director of the Section of Technical Sciences; manager “Industry Project & Engineering Systems”.

Sahana Disaster Management System heeft ontworpen en ontwikkeld om families te helpen opsporen en het werk van de reddingsorganisaties te coördineren tijdens en na het tsunamidrama. Sahana is ontwikkeld op een *Free Open Source Software platform* (FOSS), een vrij open toegankelijke programmeertaal die door om het even wie kan gebruikt en aangepast worden aan de lokale gebruiken (taal, organisaties, ...) in functie van de regio of de gemeenschap waar het toegepast wordt zodat ook arme landen het programma kunnen gebruiken.

MOTS-CLES. — Désastre; Réaction; Gestion de crise; Sahana; Systèmes informatiques; FOSS; Communication.

RESUME. — *Réaction de crise ou gestion d'aide aux désastres.* — Au lendemain du désastre provoqué par le tsunami de décembre 2004 dans le Sud-Est asiatique, plusieurs organismes de secours partout dans le monde étaient disposés à prêter main-forte dans les différentes régions dévastées. Afin d'augmenter l'efficacité des interventions, une quantité énorme de données doit être collectable et distribuable. Au Sri Lanka, par exemple, on a constaté qu'aucun logiciel opérationnel permettant la collecte d'informations sur les victimes et les disparus n'était sur le marché. Dès lors, un groupe d'informaticiens volontaires s'est formé pour développer ensemble le *Sahana Disaster Management System*, système de gestion des désastres permettant de retrouver la trace des victimes, de leurs familles et de coordonner les efforts des différentes équipes et organisations de secours pendant et après le drame du tsunami. Le programme a été développé selon une plateforme FOSS (*Free Open Source Software platform*) en langage de programmation simple, ouvert et accessible à tous ceux qui veulent l'utiliser et l'adapter aux us et coutumes de régions et/ou communautés touchées (langues, organisations, ...), et surtout gratuitement accessible aux contrées pauvres et démunies.

1. Introduction

There are three kinds of threats:

- Regular threats: events that occur so often that the system and experience learn how to respond, e.g. medication errors, fires in buildings and forests, chemical releases, epidemics, ... Regular threats can fairly easily be brought under control and the rescue solutions can be based on standard procedures. These can be recurrently reviewed on a regular basis according to most recent experience.
- Irregular threats: single occurrence events, but they are so many and hence so different that it is practically impossible to provide a standard response. Although they are imaginable, they always come unexpected, e.g. shipwrecks, earthquakes, oil spills, coastal pollution, ... The solutions to their response require some improvisation.

— Unexampled or unprecedented events: events that are virtually impossible to imagine and that exceed an organization's collective experience (e.g. Chernobyl, New York World Trade Center attack 9/11). The solution requires a management having the ability to predict, to self-organize, and to formulate and monitor complex and often wide-ranging responses in a constant evolutive environment [1]*.

As summarized in figure 1, the different threats or kinds of events can be characterized by their occurrence frequency, their severity and, hence, their consequences on exposed population and their environment, the readiness of the salvage organizations, the resources these organizations need according to the importance of their intervention, the available procedures which enable an efficient response and, finally, the quantity and quality (reliability) of the information available before and during the response. According to the kind of event, we can consider the response a standard operation for the regular threats and a crisis management for irregular and exceptional, unprecedented threats.

	Regular threats	Irregular threats	Unexampled threats
Frequency	High	Low, but imaginable	Extremely rare and hardly imaginable
Severity, consequences	Low, well-known	Serious, reason for concern	Extremely high, disastrous
Readiness	High, prepared responses (tactical)	Low, opportunistic responses	Impossible
Resources	Available and appropriate	Partly available, but used by others as well	Not available, must be generated on spot
Responses	Specific, prepared. Specific capabilities	Generic, generic capabilities	Unique, created in the situation
Data, information	Statistics, event reporting	Simplified models, experience	Hunches, beyond models

← NORMAL OPERATION CRISIS →

Fig. 1. — Characteristics of threats.

2. Nature of Crisis and Disasters [2]

A crisis is an unstable condition, as in political, social or economic affairs, involving an impending abrupt or decisive change. It is:

* Numbers in brackets [] refer to the notes and references, pp. 465-466.

- **Sudden**: the onset is sudden and usually unforeseen;
- **Serious**: there is a serious disruption in the functioning of a community or a society;
- **Overwhelming**: significant and widespread human, material, economic and/or environmental losses exceed the ability of the affected community or society to cope within its own resources;
- **Swift**: the development of events following the sudden onset is so rapid that it exceeds the ability to respond;
- **Surprising**: events often develop in unexpected directions, thus challenging the readiness and resources of the responding organizations.

After a disaster a lot of organizations are mobilizing and coming to the site(s) in order to cooperate in relief operations. Airfields are over busy and other catastrophes have to be avoided. Site allocation for each organization has to be specified, the availability and specificity of the different salvage teams have to be known, how many and where they are located, etc. In a typical disaster site you can find several Non-Governmental Organizations (NGOs), local and foreign army contingents, authorities of the affected country, UN relief agencies, expatriates living in the area, local population, affected, willing to help or seeking for victims, experts in the different specialized fields, local or remote, contractors dispatched to the disaster site cleaning and/or reconstructing, and governmental agencies which have dispatched or which are on the verge of sending rescue teams. All these people seek for instant and reliable information about the whereabouts and to convey their services to whom it may help/support and they all need to communicate with each other. In certain situations, up to six different communication modi were used simultaneously (analogue and digital walkie-talkies, cell phones, wired-land phones, satellite com, internet Wifi or other CBs) [3]. This of course is possible as long as those communication platforms are properly equipped and geared up, with enough capacity and operability, which is not always the case after a major event. Though, many mobile units can be installed in a minimum of time. Most often scarce communication facilities are at hand.

Communication may be a key issue, but information, data, is another one.

3. The Sahana Project

The Sumatra-Andaman earthquake of December 26, 2004, with an undersea epicentre off the west coast of Sumatra, Indonesia, triggered a series of devastating tsunamis that spread throughout the Indian Ocean killing approximately 230,000 people, including more than 168,000 in Indonesia and over 30,000 in Sri Lanka. As in other major disasters like the Indian Ocean tsunami, the need for accurate and timely information is as crucial as a rapid and coherent coordination among the international humanitarian community [4, 5, 6].

Effective information systems that provide timely access to comprehensive, relevant and reliable information are critical to humanitarian operations. The

faster the humanitarian community is able to collect, analyse, disseminate and act on key information, the more effective will be the response, the better needs will be met and the greater the benefit to affected populations (figs. 2 & 3) [7].

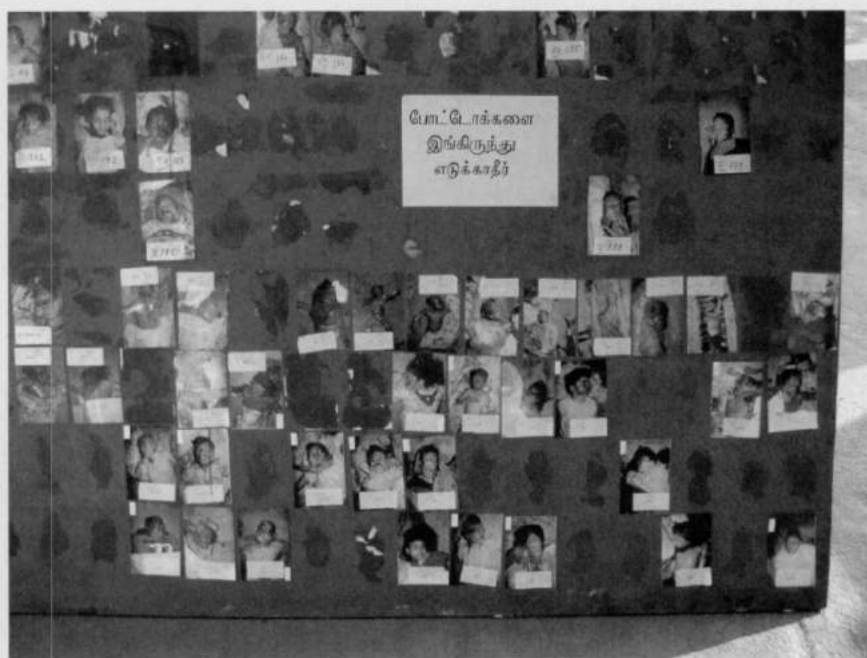


Fig. 2. — Sri Lanka: pictures of retrieved victims waiting for identification.



Fig. 3. — Sri Lanka: manual data collection of mission people and registration of information requests.

3.1. INTRODUCTION

In the Sinhalese language, “Sahana” means “relief”, and the Sahana Disaster Management System development was initiated by considerable relief coordination needs in Sri Lanka following the tsunami.

The Sahana Disaster Management System was conceived during the 2004 December Asian Tsunami. It was developed to help manage the scale of the disaster and was deployed by the government’s Center of National Operations (CNO), which included the Center of Humanitarian Agencies (CHA). Based on the success of this initial application and dreadful need for good disaster management solutions particularly able to handle large-scale disasters, SIDA (the Swedish International Development Agency) funded a second phase through LSF (Lanka Software Foundation) to generalize the application for global use and to help in any large-scale disaster. The project is now growing to become a globally recognized project with deployments in many other disasters such as the Asian Quake in Pakistan (2005), the Southern Leyte Mudslide Disaster in the Philippines (2006) and the Yogyakarta Earthquake in Indonesia (2006). Following the tsunami the system was rebuilt from scratch on the stable Free and Open Source technology stack, AMP (Apache MySQL, PHP/Perl).

The system is available for free for anyone to download and customize based on their requirements and the only latest release of Sahana just before the end of phase II has been downloaded over 8,000 times from all over the world [8].

The system is tested to work on GNU/Linux, Windows XP, Mac OS X and FreeBSD operating systems and is also available on a LiveCD or which boots up all from a CD drive without requiring installation. The system is very scalable and it can operate standalone on a laptop without network connection for a single responder up to a server cluster for thousands of users. The focus on design has been on usability, adaptability and resilience to make it suitable for disaster scenarios. This phase II, again funded by SIDA, did much to foster the capability of the project and the global community, now 170+ strong around it.

3.2. SAHANA PROJECT GOALS

The scope of the Sahana project is to be an integrated set of pluggable, web-based disaster management applications that provide solutions to large-scale humanitarian problems in the relief phase of a disaster.

The aspirations on the project are captured in the following goals:

- **Most crucial:** help lighten human suffering and help save lives through the efficient use of **IT** during a disaster;
- Bring together a diverse set of actors from government, emergency management, NGOs, international NGOs, spontaneous volunteers and victims themselves in responding effectively to a disaster;
- Empower the victims and their next of kin and hence better enable them to help themselves;

- Protect victim data and reduce the opportunity for data abuse;
- Provide a free and open source solution end-to-end available to everyone.

The Sahana system can be deployed on a variety of models, ranging from operating totally within a single notebook computer (with or without a portable wireless LAN) to a fully distributed, networked platform.

3.2.1. Large-scale Deployment

Often the disaster coordination hub is far from the affected region, making network-based operation possible even though the affected region might have its telecommunication infrastructure destroyed. Access can be provided in the affected region with the support of groups such as Ericsson which provide satellite-based wireless LAN connectivity to networks.

3.2.2. Lightweight Deployment

If such infrastructure does not exist, Sahana, being a “lightweight” solution, can efficiently scale down to a standalone laptop and a secured portable wireless access point for short-range network collaboration. Such a requirement is often the case in a disaster coordination hub when there is no internet or power during the initial post-disaster moments. The Sahana system has been tested to work with the above equipment at about 130W, which can be easily supported by a solar panel should power not be available. Additionally none of the applications depend on being connected to the internet.

Sahana also has the ability to synchronize data between its multiple instances. This allows for responders or district offices to capture data on victims in the field and seamlessly exchange data with the other field offices, headquarters or responders, using USB flash drives or CDs.

3.2.3. Modular System

Sahana is a suite of web-based applications that provide management solutions and address different problems with regard to the information required for managing coordination problems in the aftermath of a disaster. It provides several components listed below.

- | | |
|--|--|
| Organization Registry | <ul style="list-style-type: none">• To help self-distribute, monitor and coordinate agencies and their geographic and sectoral coverage.• Provides a report of who is doing what and where (W3), leading to gap analysis of relief efforts. |
| Missing People Disaster Victims Registry | <ul style="list-style-type: none">• To trace individuals, whether injured, missing, displaced, dead, orphans, and so on.• Information on the person seeking them is also captured, which adds to the chances of people finding each other. |

- | | |
|-----------------------------|---|
| Camp Registry | <ul style="list-style-type: none">• To report, track, and help manage shelters and their residents, whether temporary (schools, hospitals, residences) or semi-permanent (camps, new settlement).• Maps locations, capacities, and requirements of camps to facilitate effective management. |
| Request Management System | <ul style="list-style-type: none">• To track supply and demand of aid, monitoring movement of aid supplies.• Matches requests of aid and supplies to pledges of support.• It effectively looks like an online aid trading system tracking request to fulfilment. |
| Inventory Management System | <ul style="list-style-type: none">• Provides basic inventory control for camps and warehouses, allow coordinators to review where supplies exist, when resupply must occur, and expiration dates. |
| Messaging Module | <ul style="list-style-type: none">• For generating alert messages as a client to responders in the field.• Stores complex messages as templates for later use. |
| Situation Mapping Module | <ul style="list-style-type: none">• Allows annotation on a map with text and images of the disaster. |
| Synchronization Module | <ul style="list-style-type: none">• Allows the data from disconnected Sahana systems to be synchronized.• Enables exchange through USB flash drives or similar devices in disasters where Internet connectivity is an issue. |

Through the disaster and relief management made possible by the Sahana system, the relief effort was made more efficient and because of this, more lives were saved and the victims were able to have access to vital resources more quickly (fig. 4) [9].

3.3. WHY THE "FREE OPEN SOURCE SOFTWARE" (FOSS)?

Very few countries and organizations (rich and poor alike) can afford to invest a lot of resources in disaster management when there is no disaster present because there are always higher priority items that need funding. There are also few proprietary software applications for disaster management as practically and ethically it will be difficult to impose strict licensing terms during humanitarian disasters and times of crisis. A system built with FOSS and made available as FOSS can overcome these issues. FOSS development tools can be obtained free

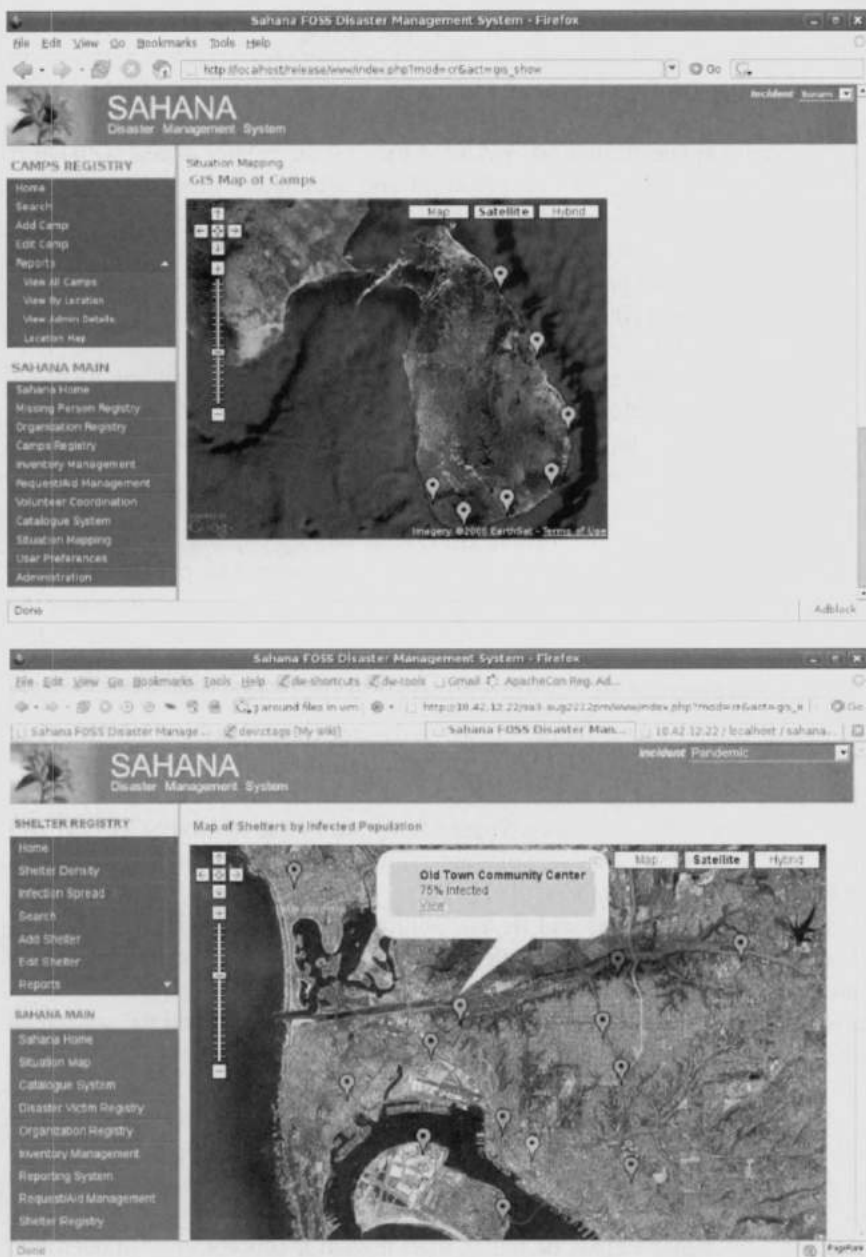


Fig. 4. — Screenshots of the Sahana software.

of charge and the FOSS software development model encourages worldwide volunteer and community involvement. With FOSS there need not be any delays in getting permission for a license as anyone has the freedom to download the software and use it. Also such systems should be developed and shared globally as the problems and needs they address are difficult for a country to deal with when a disaster strikes. The FOSS development and community mechanisms have a proven track record to build, distribute and maintain such global systems.

The choice of FOSS makes the system open and transparent and is more likely to be trusted by all parties involved in the disaster relief effort. This is important as during such trying circumstances, tensions and problems can arise among the parties involved.

As no two disasters are alike, often localizations and customizations are needed for the software before it can be applied effectively to a disaster. With FOSS, the code is available for anyone to quickly pick up and make the necessary customizations without restriction.

Thus, it can be seen from the discussion above that a disaster management system developed and implemented as FOSS is very appropriate. It is possible to develop such systems at a much reduced cost compared to pure commercial development models. A small team is needed to drive such a project to ensure the quality of the product and this team can then be assisted by the global FOSS community to develop a good-quality disaster management system. This is the working arrangement for the Sahana project, it has a core team of six people assisted by a global community of over sixty participants and contributors. The FOSS community spirit, philosophy and mechanisms have been the key ingredients in the successful growth of such a vibrant community for Sahana. For more information, see the Free Open Source Software Portal of UNESCO [10] and more in "Why Open Source Software / Free Software (OSS/FS, FLOSS, or FOSS)? Look at the Numbers!" [11]

The success of Sahana and its availability as FOSS means that for the first time it is possible to have a single cohesive disaster management system that international aid and relief organizations as well as national governments can use. If this can be realized, it will make disaster management and the associated relief effort much more efficient and beneficial for both givers and receivers alike.

The Sahana Project has inspired the concept of "humanitarian FOSS" which is effectively the application of FOSS to alleviate human suffering. This concept does not just apply to disaster management, but it extends to humanitarian ICT or any other ICT activity or product that concerns the improvement of human welfare. One major impact of this is that, if such a concept is positioned and promoted properly, there can be many volunteers flocking to build and contribute to such projects globally, as the FOSS community is well known for its strong beliefs and actions for the benefit of the community at large [12].

3.4. NEW DEVELOPMENTS ON BEHALF OF THE SAHANA PROJECT BY AND UNDER TRINITY COLLEGE'S IMPULSE [13]

Volunteer Management Module

Sahana's Volunteer Management (VM) module was developed by a team of volunteers based at Trinity College in Hartford, CT, USA. Its design and development process is described in more detail in various publications [14, 15, 16].

The Trinity Sahana effort began in January 2006 when Trishan de Lanerolle, a 2004 alumnus of Trinity College, returned from a visit to his native Sri Lanka with news about an IT system written by a group of volunteer programmers in the aftermath of the Asian tsunami: "We had been considering ways to incorporate free and open source software (FOSS) development into our curriculum ever since reading a call by ACM President David Patterson underscoring the importance of FOSS and its lack of coverage in undergraduate computer science" [17]. Sahana looked like the perfect platform.

During spring 2006, Sahana was assessed as being a potential system for teaching undergraduates about FOSS. Together with two students the software was downloaded and installed; a couple of small practice modules were successfully developed. The students had no difficulty understanding Sahana's LAMP (Linux/Apache/MySQL/PHP) platform. At that time, being a fairly small in scale project compared to some of the larger FOSS development projects, the Sahana project run by people with whom Trishan had direct communication, did provide an ideal environment for Trinity students to work on a real world FOSS project.

During summer 2006, a group of volunteers from Accenture Corporation, who had also heard about Sahana, joined the Trinity team seeking for partnership. They arranged meetings with contacts in National Volunteer Organizations Active in Disaster (NVOAD) and together it was agreed that an IT system for volunteer management was much needed. The main requirement of the VM module was to support the registration of relief volunteers and their assignment to projects. Currently, the VM contains the following features:

- Volunteer registration and assignment;
- Volunteer and administrative portals;
- Google mapping of projects and volunteers;
- Project registration;
- Messaging;
- Reporting;
- Management and administration.

Working through the summer a prototype VM module was developed. It provided a *registry* for volunteers and a *management* interface for coordinators and project leaders. It also included *messaging* and *search* functions, as well as a *report generation* capability. In terms of its overall functionality, it resembles

many of the requirements identified in [18], a comprehensive study performed by the Institute for Crisis, Disaster, and Risk Management at George Washington University. In August 2007 our prototype VM was given a field test during the Strong Angel III Disaster Response Demonstration in San Diego [19], where the VM registry was used to register all of the participants in the exercise.

During spring 2007, Trinity College offered a course on Humanitarian FOSS — that is, a study of FOSS projects that benefit humanity or society in some way. This course had twenty-five students from the three campuses — Trinity, Connecticut, and Wesleyan colleges. The goal in this course was to use the Sahana system as an educational platform, teaching students how a real world FOSS system is designed and built. One encountered problem is that new students had great difficulty understanding the VM module as it was designed and coded at that time.

During the academic year (2007-2008), Trinity has continued to engage students from various schools in refinement and maintenance of the VM module. The most significant development during this period has been the creation of a standalone version of the VM called VMOSS (Volunteer Management Open Source Software) [20]. The purpose of the standalone version is to provide a free volunteer management system to groups besides those involved in disaster recovery. Since being posted to sourceforge in April 2008, the system has been downloaded more than 150 times. This idea of developing software that solve some problem and then sharing it with your friends and neighbours is at the very heart of the FOSS movement.

3.5. HUMANITARIAN FREE AND OPEN SOURCE SOFTWARE PROJECT

The basic idea behind the Humanitarian Free and Open Source Software (HFOSS) project is that undergraduate computing education can be revitalized by getting students engaged in building free and open source software, which serves humanity in some way. HFOSS is a collaborative project involving three primary schools: Trinity College, Connecticut College and Wesleyan University.

The specific goals of the project are:

- To introduce the concept of free and open source software development into the undergraduate curriculum;
- To attract new demographics to computing, particularly more women and minorities;
- To debunk the idea that computing is nothing but programming;
- To bring together “town and gown” by working with IT corporations and community service organizations;
- To create opportunities to collaborate on projects that benefit the community;
- To develop a portable and sustainable model and a repository of resources that will enable other schools to join the project.

Ongoing HFOSS developments at Trinity College are:

- Sahana VM: this team is performing maintenance on the VM module as well as developing important new functionality, including incorporation of a volunteer credentialing capability.
- OpenMRS (Open Medical Record System), which is a joint project of Partners in Health and the Regenstrief Institute [21]. Its goal is to develop a FOSS medical record system for use in poor villages in Africa. It is currently deployed in Rwanda and several other poor African communities. The toolkit is now available under a FOSS license on Sourceforge, the largest repository for open source software [22].
- AppTrac, which is an application tracking and monitoring system developed for Literacy Volunteers of Greater Hartford (LVGH). LVGH is a local organization that provides literacy tutoring for adults. They currently manage their tutoring lab completely by hand. AppTrac will provide a portal into their tutoring programs that will manage student logins, monitor usage of LVGH's tutoring software, and provide reports of student activity and performance. This is an example of how computing students can develop HFOSS that benefits organizations in their own local or regional neighbourhoods.
- POSIT (Portable Open Source Identification and Tracking tool), which is a phone-based search and rescue tool developed on Google's Android platform, a FOSS programming interface for mobile phones. Equipped with a built-in database, global position system (GPS), telecommunication technology, POSIT will enable any handset that supports Android to be used to assist rescue workers during a disaster recovery effort. The current prototype is designed to map the locations of victims, store and transmit identifying to rescue headquarters, photograph and tag victims, and perform other tasks that assist rescue workers.
- The InSTEDD (Innovative Support to Emergencies, Diseases and Disasters) [23], early warning project, which is developing a FOSS system that will automatically monitor news feeds, blogs, alert networks and other sources of information to search for disease outbreaks and other health events. This team is helping to develop machine learning algorithms that will automatically detect certain events.

3.6. LATEST ONGOING DEVELOPMENTS TO THE HFOSS SAHANA SOFTWARE

3.6.1. GIS Map Editor

Disasters, geographic location and geographic information cannot be separated from a broader perspective. Thus, the effect of the disaster is dependent on the geographic location where it happened. On the other hand, for the disaster management it is an important aspect from initial planning to the actions. Top-level people who are supposed to take strategic decisions regarding disaster man-

agement are supposed to be provided with relevant data, thus on the GIS perspective, a powerful mapping application with customizable and detailed maps is well suited for giving geographic-related information. Once combined with the other relevant data about the disaster it will become a precious tool.

Sahana is a world-class Free and Open Source (FOSS) project within the humanitarian domain and will become a more significant tool with the development of the Sahana GIS framework itself combined into it.

3.6.2. GIS Situation Awareness

This project intends to build up the existing Sahana Situation Mapping Module by providing a number of geospatial type libraries that will represent objects, areas and routes in a disaster situation. On top of this, an interface for users to create and save their own objects will be added. The viewing system will have enhanced filtering options to give each team an uncluttered view of any situation. Extra features for this would be added to the developing GIS module analysis. Lastly the project will look at ways in which other modules in the Sahana Management System can use these data to best effect, including the ability to create new geospatial features in addition to improving the currently implemented nodes; these will represent new disaster types such as:

- Disaster Routes: might represent supply routes and new escape paths (lines);
- Disaster Areas: might represent an area affected by fire or flood (polygons).

Each of these new types will have a number of user-defined variable attributes associated with them, for example: population of area, supplies assigned, population density, images, etc. If no one else is assigned I would also like to work on the GIS analysis section to incorporate new features involved with the above. In doing this, the improvement of the HCI (human-computer interaction) processes involved in creating these disaster types would make the processes more straightforward. After completing this, the next goal is to improve the ability to filter these data so that a comprehensive map could be built up of the whole affected area which could be then tailored to each of the response team's needs.

3.6.3. GSM-based Messaging Module

- Ability to access Sahana via SMS menus.
- SMS Tools packaged in the Portable Applications release.
- Keyword Management (select quick contacts based on keywords).
- MMS Integration.
- SMS alerting channels: users can subscribe to channels to receive SMS. Subscription can be done by SM itself.

3.6.4. Post-Disaster Need Assessment Module

This is basically to address the long-term needs of post-disaster situation. So, the main objective of this module is to serve the victims to recover their day-to-day lifestyle. The other objective is to provide a clear image of the damages

caused by disaster. This is very helpful to manage the post-disaster situation. First of all, their needs should be collected. Then, we can prioritize their needs, as they requested. The needs can be fulfilled with the available resources. This module is meant to make a mechanism to collect their needs (what the victims lost due to disaster), assess them and find the opportunities to recover them.

Need Assessment is simply defined as a statement of what needs to be done. Victims may have several needs. This can be as a group (family/team/organization) or as individuals. These two kinds of aspects should be considered as well.

3.7. PAST DEPLOYMENTS

- **Tsunami – Sri Lanka 2005**: officially deployed in the CNO for the Government of Sri Lanka;
- **Asian Quake – Pakistan 2005**: officially deployed with NADRA for the Government of Pakistan;
- **Southern Leyte Mudslide Disaster - Philippines 2006**: officially deployed with the NDCC and ODC for the Government of Philippines;
- **Sarvodaya – Sri Lanka 2006**: deployed for Sri Lanka's largest NGO;
- **Terre des Hommes – Sri Lanka 2006**: deployed with new Child Protection Module;
- **Yogjarkata Earthquake – Indonesia 2006**: deployed by the Australian Computer Society (ACS), UrRemote, the Indonesian whitewater association and the civil society Indonesian Relief Source;
- **Chengdu Earthquake – China may 2008**: IBM's crisis response team customized and translated Sahana software, a free, open-source disaster management system, into simplified Chinese to coordinate relief efforts;
- **Myanmar Cyclone – May 2008**: over thirty volunteers from across four continents working on tailoring Sahana to Burmese language;
- **Pandemic Cape Town, Western Cape – South Africa**: HIV Aids Pandemic;
- **Pandemic Abuja, Abuja Federal Capital Territory – Nigeria**: HIV Aids Pandemic;
- **Military Conflict Baghdad, Baghdad – Iraq**.
- **Wildfire Sydney, New South Wales – Australia**: Emergency Response Plan.

Sahana has gained a tremendous amount of recognition for the project and for the concepts it promotes.

3.8. RECOGNITION

Though application of Sahana is the greatest recognition of the value of the Sahana system to help out in disasters, the team's work also has been recognized in other ways:

- Sahana won the **Free Software Foundation Award for Social Benefit in 2006** amongst other contenders such as OLPC, Project Gutenberg and Wikipedia;
- **Software 2006, USA**: Good Samaritan Award in 2006;
- **Network World Article 2006 on Watch Identified** as one of the top 10 Open Source “companies” to watch by Network world;
- Interview of core team in **BBC** programme “**code breakers**” in 2006;
- One of the three top finalists in the Health category in **Stockholm Challenge** in 2006;
- **Sourceforge Project of the Month** for June 2006;
- **Red hat User Award** given to the founder of Lanka Software Foundation, Dr Sanjiva Weerawarna, in 2005.

The Free Software Foundation (FSF), known as one of the two leading organizations responsible for the FOSS movement, has created a new award based on humanity, which was directly inspired by Sahana [24].

The private sector has shown great interest as well. Some of the Sahana deployments have been directly supported and proactively promoted by the IBM crisis response team, and much interest is being shown by other large IT companies.

4. Conclusion

With the key characteristics of an open-access approach, low-cost deployment and easy adaptability, FOSS disaster management systems will play an increasingly important role in the humanitarian sector. Our experiences in the field over the past two years with Sahana have shown that the FOSS approach has much to offer to the coordination of agencies’ response to large-scale disasters. Development of Sahana will continue under the guidance of the Lanka Software Foundation, with a long-term objective to grow into a complete disaster management system capable of handling disaster mitigation and preparation, relief activities, recovery and reconstruction [25].

Honorable Avelino J. Cruz, Jr., Secretary of National Defense in the Philippines, expressed when discussing the deployment of Sahana in response to the Leyte landslide disaster in early 2006: “There is no greater innovation that matters more than that which saves lives”.

BELGIUM

The Royal Military Academy is developing a communication system on behalf of the Belgian First Aid and Support Team: B-FAST.

When earthquakes hit Turkey in August and November 1999, Belgium was on both occasions among the first countries to provide relief and assistance. Although the assistance from our country was highly appreciated, our govern-

ment has deemed it necessary to set up a structure that can be mobilized at any time. Its objective is to give a quicker and more efficient response to emergency situations. When human lives are at stake, one can never be *too* efficient.

In November 2000, proposed by the Minister for Foreign Affairs, the Minister for Home Affairs and the Minister of Defence, the Federal Council of Ministers authorized the creation of a rapid response organization which objective is sending emergency rescue and support teams to a country or countries affected by a man-made or natural disaster. On 28th February 2003 a “royal decree” legalized the B-FAST and confirmed its role [26].

Whenever and wherever a crisis breaks out, speed of reaction is of paramount importance; a decision must be taken immediately and hence the Belgian emergency teams can be mobilized within twelve hours following a decision to get in action. The duration of an intervention is limited to ten days on the site of a disaster.

In order to provide a dynamic updating source of information combined with a home to field disaster relief operations communication system, a prototype of an Information System for Disaster Relief Operations has been developed by the Royal Military Academy (RMA) of Belgium (fig. 5).

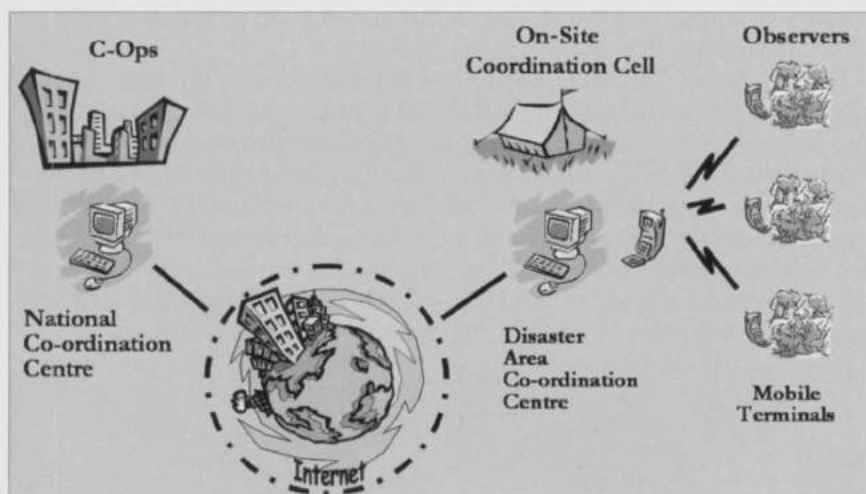


Fig. 5. — Concept of RMA's system.

Existing traditional information systems are too big, too complex, and they take too long to deploy. An information system that is usable for disaster relief operations has to be mobile (because of the small and fast moving teams), rapidly deployable (it is known that in the first hours after the disaster event the chances of finding people alive are larger) and user friendly (because the relief workers are seldom Information Technology experts). For the building of the prototype a contact has been established with the end user B-FAST. The struc-

ture proposed is based on the experiences the lab had with B-FAST, but it also corresponds with the operational structure used by NGOs [27].

The first actor in a disaster relief operation is the crisis centre in the home nation. In B-FAST terminology it is called "C-Ops", or the "National Co-ordination Centre". When B-FAST arrives at the disaster area, they will immediately set up an "On-Site Coordination Cell" and make contact with the National Co-ordination Centre using a fixed or a satellite connection. This second actor will be referred to as the "Disaster Area Co-ordination Centre" (DACC). Finally, relief workers who are going on a reconnaissance expedition in the disaster area can be seen as the third actor. They are known as "Observers" or called "Mobile Terminals" (fig. 5) [28].

The information system for disaster relief operations should be able to manage and visualize a lot of information coming from very different sources. In the NCC more static data will be transferred from existing human and material resources information systems. A gateway will be used to ensure the communication and to enforce policies on information exchange. Geographic data, like satellite images, orthophotos and cartographic maps in digital format, will be received from external data providers and last but not least, a communication gateway to third parties like NGOs and the press will be implemented to inform them on the situation of the ongoing operations.

A great deal of data that is managed by the NCC will certainly draw the attention of the relief team in the disaster area. These data will be sent to the DACC using a Wide Area Network. In the disaster area co-ordination centre the data, transmitted by the NCC, will be locally managed and visualized by the information system. Data coming from a generic sensor network or external data providers, like the local government, are to be handled in the DACC and sent to the NCC and to the mobile terminals. These mobile terminals will also mainly gather field data and send them back to the DACC, where the data will be managed before being sent to the NCC (fig. 6).

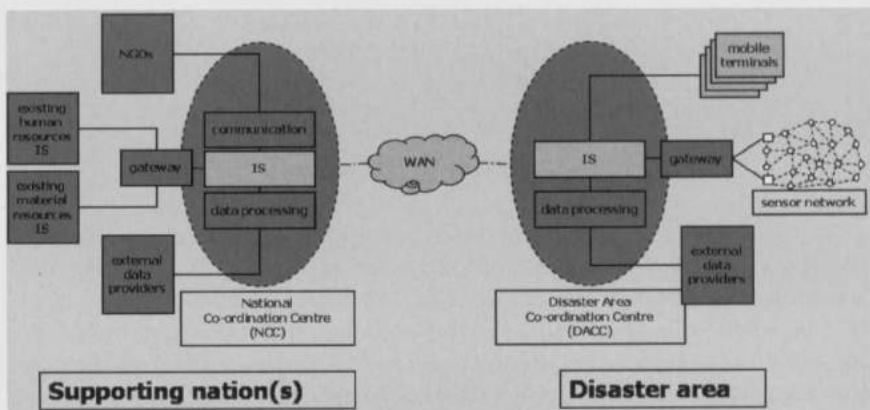


Fig. 6. — General Overview of RMA's Information System's Concept.

Development of the system is still going on at the time of the publication of this article.

ACKNOWLEDGEMENTS

I want to express my special thankfulness and appreciation to my friends Chamindra de Silva, who is lead contributor to the Sahana FOSS Disaster Management System and acting executive director of the Lanka Software Foundation, and Prof. Ralph A. Morelli, Department of Computer Science, Trinity College, Hartford CT, USA, who helped me a lot to appropriately document this contribution.

Additionally I want to extend my thanks to Prof. W. Meert of the Royal Military Academy and Prof. Bartel Van De Walle, assistant prof. of Information Systems at Tilburg University in The Netherlands and founder and ever enthusiastic animator of ISCRAM, International Community on Information Systems for Crisis Response and Management.

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Rapport sur les activités de l'Académie (2006-2007) Verslag over de werkzaamheden van de Academie (2006-2007)

par / door

Danielle SWINNE*

Monsieur le Président, Excellences, Mesdames et Messieurs les Présidents, Mesdames et Messieurs les Secrétaires perpétuels et perpétuels honoraires des Académies, chers Consœurs et Confrères, Mesdames, Messieurs,

Mijnheer de Voorzitter, Excellenties, Dames en Heren Voorzitters, Dames en Heren Vast en Erevast Secretarissen van de Academiën, waarde Consororen en Confraters, Dames en Heren,

Vous retrouver d'année en année, toujours aussi nombreux pour célébrer la rentrée académique, reste pour moi un grand honneur doublé d'un réel plaisir, et je souhaite donc remercier tous ceux qui, sacrifiant à la tradition, nous ont rejoints aujourd'hui.

Il m'incombe, en tant que Secrétaire perpétuelle, de clôturer cette séance en vous rappelant les événements marquants de l'année écoulée et mon premier devoir sera d'évoquer la mémoire de deux confrères récemment disparus.

Op 22 februari 2007 overleed onze Confrater **Severin Amelinckx**, eregeassocieerd lid van de Klasse voor Technische Wetenschappen. De Heer Amelinckx was doctor in de wetenschappen van de Rijksuniversiteit Gent, waar hij later buitengewoon hoogleraar werd. Hij doceerde ook aan de Vrije Universiteit Brussel en aan het Rijksuniversitair Centrum Antwerpen. In 1975 werd hij directeur-generaal van het Studiecentrum voor Kernenergie in Mol. Hij was lid van diverse geleerde genootschappen, waaronder de *International Union of Pure and Applied Physics*, de *International Union of Crystallography*, en van de Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten. Zijn lofredde zal op 20 december uitgesproken worden door Confrater Paul De Meester.

Confrater **André Huybrechts**, erewerkend lid van de Klasse voor Morele en Politieke Wetenschappen, overleed op 10 mei 2007. Hij was doctor in de rechten

* Secrétaire perpétuelle de l'Académie, rue Defacqz 1/3, B-1000 Bruxelles (Belgique). / Vast Secretaris van de Academie, Defacqzstraat 1/3, B-1000 Brussel (België).

van de Katholieke Universiteit Leuven en doctor in de economische wetenschappen van de *Université Catholique de Louvain*. Zijn loopbaan startte op het *Ministère des Affaires africaines*, waar hij kabinetschef werd. Later doceerde hij onder meer aan het *Centre européen de formation des statisticiens-économistes des pays en développement* en was hij onder andere werkzaam bij de Algemene Directie voor Ontwikkelingshulp van de Commissie voor de Europese Gemeenschappen. Confrater Huybrechts was lid van de Belgische Vereniging voor Afrikanisten en van het Instituut voor Internationale Relaties.

Ik nodig U uit onze overleden Confraters even te herdenken.

Je vous invite à présent à un instant de recueillement à la mémoire de nos Confrères disparus.

Les 297 membres que compte notre Compagnie en ce début d'année académique se répartissent comme suit: 2 membres d'honneur, 119 membres titulaires et titulaires honoraires, 72 membres associés et associés honoraires et 104 membres correspondants et correspondants honoraires.

Het voorzitterschap van onze Academie is dit jaar in handen van Confrater Christian Sturtewagen, lid van de Klasse voor Morele en Politieke Wetenschappen. In 2008 zal Confrater André Ozer, lid van de Klasse voor Natuur- en Geneeskundige Wetenschappen, het roer overnemen.

La première Classe, dirigée cette année par notre Confrère Sturtewagen, sera prise en charge l'an prochain par notre Confrère Petit, la seconde Classe, dirigée cette année par notre Confrère Van Ranst, passera entre les mains de notre Confrère Ozer, tandis que la troisième Classe, dirigée actuellement par notre Confrère De Meyer, sera confiée à notre Confrère Dejonghe.

De Klasse voor Morele en Politieke Wetenschappen verwelkomde de Heer **Koen Vlassenroot** als nieuw geassocieerd lid. Confrater Vlassenroot doceerde in de politieke wetenschappen aan de Universiteit Gent, waar hij nu professor politieke wetenschappen en onderzoekscoördinator van de *Conflict Research Group* is. Zijn onderzoeksactiviteiten situeren zich vooral in Centraal-Afrika.

La Classe des Sciences naturelles et médicales accueille, quant à elle, deux nouveaux membres associés: **Rosine Orban**, docteur en sciences de l'Université Libre de Bruxelles, où elle est chargée de cours, enseigne la paléontologie humaine et la paléanthropologie. Elle est également chef de travaux agrégé à l'Institut royal des Sciences naturelles de Belgique.

Vincent De Brouwere est docteur en médecine de l'Université Catholique de Louvain. Il est chargé de cours au département de Santé publique de l'Institut de Médecine Tropicale d'Anvers et est impliqué dans divers projets centrés sur l'organisation des structures de soins de santé.

De Klasse voor Natuur- en Geneeskundige Wetenschappen heeft versterking gekregen van drie nieuwe corresponderende leden, met name de dames Ruth Oniang'O en Jurgenne Primavera, en de Heer Samy Mankoto ma Mbaelele.

Ruth Oniang'O is doctor in *food sciences and nutrition* van de Universiteit van Nairobi en was tot voor kort professor aan de *Jomo Kenyatta University for Agriculture and Technology*. Zij richtte het *Rural Outreach Programme* op, een ontwikkelingsprogramma voor vrouwen. Mevr. Oniang'O is lid van het wetenschappelijk comité van *Nutrition Tiers-Monde* en Unicef-adviseur.

Jurgenne Primavera is doctor in de mariene wetenschappen van de *University of the Philippines*. Zij is als *Senior Aquaculture Specialist* verbonden aan het *Southeast Asian Fisheries Development Center of the Philippines*, en zij is lid van de *Asian Fisheries Society* en de *World Aquaculture Society*.

Samy Mankoto ma Mbaelele is landbouwkundig ingenieur van de *Université Nationale du Zaïre*, en *Master ès Sciences* in Ecologie en Milieu van de *Université Laval* (in Québec). Confrater Mankoto is verbonden aan de *Division des Sciences Ecologiques et de la Terre* van Unesco, waar hij, in het kader van het *Men and Biosphere* programma, verantwoordelijk is voor de coördinatie en de promotie van projecten voor het behoud van de biodiversiteit en voor duurzame ontwikkeling in Afrika ten zuiden van de Sahara.

Venons-en à la Classe des Sciences techniques de notre Académie qui a vu l'élection de cinq nouveaux membres associés!

Alain Bernard, docteur en sciences géologiques et minéralogiques de l'Université Libre de Bruxelles, est chargé de cours au département des Sciences de la Terre et de l'Environnement et directeur du Laboratoire de Géochimie et Minéralogie appliquée. Ses différentes missions d'expertise volcanologique l'ont amené à sillonner différents pays, entre autres l'Indonésie, les Philippines, le Cameroun et le Salvador.

Le deuxième membre associé à avoir intégré cette Classe est docteur en sciences géographiques de l'Université de Liège: il s'agit de **Pierre Ozer**. Chargé de recherche au département des Sciences et Gestion de l'Environnement de l'Université de Liège, celui-ci focalise ses travaux sur les variations climatiques et leurs conséquences.

Eric Pirard, docteur en sciences appliquées de l'Université de Liège, exerce en qualité de professeur ordinaire à la faculté des sciences appliquées où il dirige le secteur «Génie Minéral, Matériaux et Environnement». Il s'intéresse à l'identification, la caractérisation et l'évaluation quantitative des ressources naturelles dans la perspective d'une gestion durable.

Patrick Sorgeloos is het vierde nieuwe geassocieerd lid van de Klasse. Hij is doctor in de mariene biologische wetenschappen van de Universiteit Gent, waar hij nu gewoon hoogleraar, directeur van het Laboratorium voor Aquacultuur en van het Artemia Referentiecentrum is. Hij geeft ook gastcolleges aan verschillende Afrikaanse en Aziatische universiteiten.

Patrick Van Damme is doctor in de landbouwkundige wetenschappen van de Rijksuniversiteit Gent; hij is professor en hoofd van een onderzoeksgroep voor tropische landbouw, plantensystematiek en etnobotanie aan de Universiteit Gent, en betrokken bij verschillende projecten overzee.

La Classe des Sciences techniques accueille également un nouveau membre correspondant, le professeur **Darwish Al Gobaïsi**, docteur en sciences appliquées de la *Loughborough University* au Royaume-Uni et attaché à l'*International Centre for Water and Energy Systems* établi à Abu Dhabi. Editeur en chef des encyclopédies *Encyclopaedia of Life Support Systems* et *Encyclopaedia of Desalination and Water Resources* publiées sous les auspices de l'Unesco, il sera présent en juin lors d'une séance de Classe que nous consacrerons à ces publications.

Negen van onze geassocieerde leden werden tot werkend lid bevorderd: Confraters Filip De Boeck, Didier Demolin, Guy Vanthemsche en Consoror Bettie Vanhoudt voor de eerste Klasse, Confraters Jean-Pierre Descy, Michel Erpicum en Jozef Vercruyssen voor de tweede, en Confraters Theo Notteboom en Jean Poesen voor de derde. In naam van alle Confraters en Consororen wens ik ze van harte geluk.

Naast de commissie- en werkgroepvergaderingen, en de maandelijks zittingen, werden er het voorbije academiejaar drie buitengewone manifestaties georganiseerd:

Eerst was er, op 10 april, de studiedag *Scientific Cooperation between Europe and Latin America: What Kind of Partnership?*, georganiseerd in samenwerking met het door onze Confrater Jean-Jacques Driesbeke voorgezeten *Centre d'Etude des Relations entre l'Union Européenne et l'Amérique Latine* van de *Université Libre de Bruxelles*.

En juin, à l'initiative de notre Confrère Jean Marchal, président de notre Compagnie en 2006, et de nos autres confrères liégeois, nous nous déplaçons à l'Université de Liège pour une journée d'exception au cours de laquelle nous avons, par le biais d'exposés et d'affiches, survolé les divers projets qui lient cette université à l'outre-mer.

Le 28 septembre dernier, en collaboration avec deux autres institutions fédérales, le Musée royal de l'Afrique centrale et les Musées royaux d'Art et d'Histoire, nous organisons, à l'initiative de la Classe des Sciences morales et politiques de notre Académie, un symposium international intitulé *Expressions of Traditional Wisdom*, un thème à facettes illustrées par de multiples orateurs venus du monde entier.

Wat brengt ons de toekomst?... voor de eerste zes maanden:

In de reeks Raymond Vanbreuseghemconferenties gewijd aan de medische mycologie zal in april de volgende vergadering plaatsvinden, in samenwerking met de Belgische Vereniging voor Menselijke en Dierlijke Mycologie.

In juni, in samenwerking met Unesco, zullen de drie Klassen van de Academie vergaderen over de bekende virtuele bibliotheek *Encyclopedia of Life Support Systems*.

En ce qui concerne les publications, nous avons bien sûr poursuivi la publication de nos *Bulletins des Séances*, nous avons sorti le livre d'hommage à notre Consœur Yola Verhasselt, Secrétaire perpétuelle honoraire, ainsi que la table quinquennale de 2000-2004.

Nous avons aussi publié des actes reprenant les textes présentés lors du congrès *Africa's Great Rift: Diversity and Unity* et ceux du congrès organisé au Cambodge intitulé *Hubs, Harbours and Deltas in Southeast Asia: Multi-disciplinary and Intercultural Perspectives*.

Een aantal publicaties worden voorbereid: een paar nummers van de *Mededelingen der Zittingen*, de verhandeling van Mevr. Chantal De Jaeger, laureaat van onze Academie in 2004, de acta van de Conferentie *Desertification: Migration, Health, Remediation and Global Governance* en het tweede boek in de reeks *Fontes Historiae Africanæ* met als titel „Main-d'œuvre, Eglise, Capital et Administration dans le Congo des années trente” van de hand van Confrater Jacques Vanderlinden.

J'arrive ainsi au terme de ma présentation qui, je l'espère, vous aura convaincus du dynamisme de notre Compagnie. Il me reste à exprimer ma gratitude:

- A notre Ministre de tutelle et aux Services fédéraux des Affaires scientifiques, techniques et culturelles;
- Au président de l'Académie ainsi qu'aux directeurs et vice-directeurs de Classe;
- Aux confrères, consœurs et orateurs invités qui ont participé à la réalisation de nos activités.

Ik bedank ook:

- De leden van de commissies en werkgroepen;
- De leden van de verschillende jury's en de verslaggevers;
- En meer in het bijzonder de leden van het secretariaat van de Academie.

Ik wens Mevr. Mika Akiha en de HH. Jan De Winne en Ronan Kerno van harte te bedanken voor de muzikale intermezzi.

Je vous remercie encore pour votre présence et vous invite à vous diriger vers l'Espace Baudouin où aura lieu la réception de clôture.

Nogmaals wil ik U bedanken voor Uw aanwezigheid en ik verzoek U naar de Boudewijnruimte te gaan voor de receptie.

**SCIENTIFIC COOPERATION
BETWEEN
EUROPE AND LATIN AMERICA:
WHAT KIND OF PARTNERSHIP?**

Journée d'étude — Studiedag

10.04.2007

Welcome Address

by

Christian STURTEWAGEN*

Ladies and Gentlemen,
Dear Fellow Members of the Royal Academy for Overseas Sciences,

In the name of the Academy I give you all a hearty welcome to this seminar.

The title of our seminar ends with a question mark: "Scientific Cooperation between Europe and Latin America: What Kind of Partnership?" This means that from the organizers' point of view there is no ready answer, this means that we are still looking for an answer or at least the beginning of an answer. The answer we may find may be a very timid answer. The question mark means that there is a problem, that there is a question, that there is no immediate solution.

Thanks to the generous help and inspiration of my fellow academician and colleague, Prof. Jean-Jacques Droesbeke, who will chair the Round Table at the end of our day, I may share with you a few thoughts regarding cooperation between Latin America and Europe.

A first question, which is divided into two parts and which we can ask ourselves, is: what was the situation regarding scientific cooperation between Latin America and Europe at the end of last century and the beginning of the 21st century?

As we are speaking of cooperation between Latin America and Europe, let us first look at it from the point of view of Latin America.

The end of last century has gone through great changes in the political order of Latin America: a number of military regimes or strong regimes have been replaced by democratic governments. Unfortunately these countries were not well-off, neither from the point of view of their economy nor from their social level. Universities and research centres — especially those for social science — have been weakened by dictatorial regimes. This converged with the fact that many intellectuals thought it better to leave their country either for Europe or North America.

* President of the Academy, rue Defacqz 1/3, B-1000 Brussels (Belgium).

Once this time of hardship was over, the question of Latin America remained: where are we going to turn to for our aid request to reach our goals: North America, Europe or even Asia? Any direction was possible.

The second part of our question is: what was Europe's point of view?

A characteristic of the relationship with Latin America from Europe's point of view at the end of last century and the beginning of the 21st century is the heterogeneous nature of the will to help: on the one side Spain — and let us not forget that Spain and Portugal only joined what we now call the European Union in 1986 — with to a certain degree Germany and France, and on the other side countries with little or no interest at all.

At the same time we noticed the evolution of the relationship between Europe and the rest of the world, more particularly with Asia and Africa.

We were also in the days of the European Union opening toward the eastern European countries.

In brief, we cannot deny that Latin America was not the centre of interest of Europe over the last fifteen years.

A **second question** is: what can be done in 2007?

The European Union has become a larger entity in the meantime. Not without problems, as we all know. But this is a fact.

Today we will have the opportunity to listen to the presentation of new projects of cooperation. Latin America cannot be excluded from the European Union's strategy.

These days another event is also going on here in Brussels: the congress of CEISAL which stands for *Consejo Europeo de Investigaciones sobre América Latina*.

There have been changes in Latin America as well. The structures of research centres got stronger and toned up, if you let me use this bodybuilding expression. It is in other words an actual issue to define more sharply the way in which we have to work together in 2007. It would even be desirable, in order to avoid any ambiguity, to talk about **partnership**.

So, today we have to cope with one question, and a very simple one: **what kind of partnership do we want to establish between us?**

With this question in mind and with the desire to find a solution I am honoured and pleased to open this seminar, which I hope will be very fruitful for all of us.

Spending in R&D+I: A Challenge for Latin America*

by

Luis A. RIVEROS**

KEYWORDS. — Public Finances; Research; Education; Higher Education.

SUMMARY. — This paper argues that Latin American countries are in need of active policies aimed at increasing the spending in Research Development and Innovation (R&D+I) in order to improve their competitiveness regarding production and international trade. This is not only a problem of investing more public resources in R&D+I, since it also concerns the need of reforming prevailing policies and institutions regarding national research systems and universities. Latin America has to envisage better policies aimed at attracting more participation of private business in R&D+I, as well as promoting a real interaction among countries in the region to attain a more efficient use of resources. The relatively better economic situation that has characterized the region over the past few years is an opportunity for Latin American countries to proactively face the challenge regarding the sustainability of its development path. A closer work with the European Community can notably help to attain these objectives in a satisfactory way.

1. The Latin American Economies

Although rich in natural resources, for several decades Latin America has remarkably lagged behind with regard to economic growth. During most of the XXth century Latin America was committed to policies framed in the context of an import-substitution strategy dominated by significant state intervention across markets. A poor saving rate, low investment, reduced economic growth and stubborn macroeconomic disequilibria were the general consequences associated to those long-standing economic policies. High external indebtedness, low expenditure in science and technology, and a large reliance on exports based on commodities, especially raw materials, were also indications of a protracted economic situation which also showed up in a deteriorating social situation and recurrent political instability. With some specificities and exceptions in the case

* Paper presented at the seminar "Scientific Cooperation between Europe and Latin America: What Kind of Partnership?" held on 10 April, 2007. Text received on 27 June, 2007.

** Prof. Economics, Executive Director Asia – Latin America Center, Faculty of Economics and Business, University of Chile, Av. Diagonal Paraguay, #257, Santiago (Chile).

of different countries that are, however, worth investigating to obtain a more realistic picture, the general situation of Latin America in the second half of the XXth century can be depicted by a lasting economic deterioration and insufficient public policies.

The average per capita growth of the 1960s (2.5 % p.a.) was only enough to double the per capita income in three decades. The region attained an even lower growth in the next two decades (fig. 1), although in the 1980s this could be explained by a significant debt crisis and the beginning of a structural reform period which notably affected the growth record. The 1990s were years of economic reforms, and the region attained an even lower per capita growth (fig. 1). This scenario was also complicated by the existence of several symptoms of macroeconomic disequilibria, such as fiscal deficit, stubborn inflation, external deficit and high unemployment, all of which were evidently more pronounced throughout time.

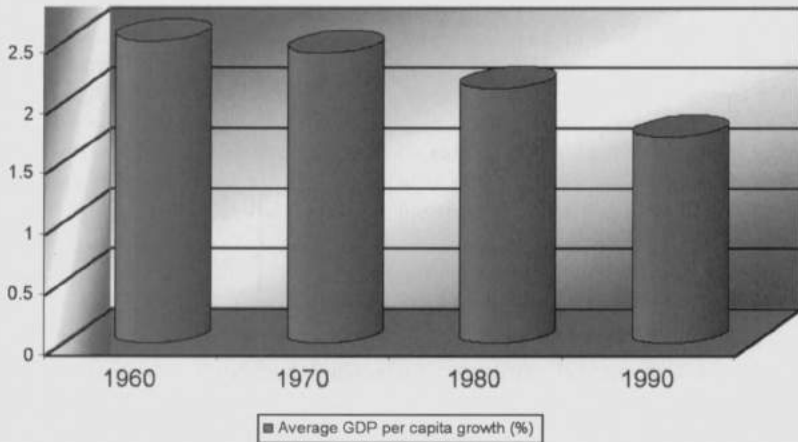


Fig. 1. — GDP (per capita) growth in Latin America (Source: World Bank (“Colombia: políticas para un crecimiento sostenible y equitativo”), March 6th 2003, Bogotá, Joseph E. Stiglitz).

Since the 1980s, most Latin American economies have undergone key structural changes through policies aimed at obtaining an opening to world trade and financial flows, as well as reducing the degree of state intervention across markets and promoting a market-oriented development strategy. The degree of success of this effort, associated to the so-called “Washington Consensus”, has been very diverse in accordance with the depth of those reforms across different countries, and also as a result of the time lasted after introducing these new policies. Chile, for instance, has been one of the earliest reformers, and perhaps the country that advanced the most in terms of the depth of the economic reforms, as a military government provided support to them in the 1980s. The observed

Chilean results with regard to economic stability, growth and investment have reached the status of world-famous, whereas all the basic policies adopted in the 1980s have been kept in place after the return of the country to a democratic system. The cases of Mexico and Brazil are also worth mentioning in terms of positive observed results derived from the instauration of structural economic reforms. Most other countries, however, have only partially reached some positive changes in the aim of attaining open economies to trade and financial flows, although most of them have eliminated their past of hyperinflation and macro-economic disequilibria. In all the countries of the region, nonetheless, a wide-spread concern exists with regard to the social stance.

Over the past few years, and as a direct result of a sustained rise in commodity prices such as oil, copper, soybean, etc, in combination with the extent of key reforms regarding traditional policies practised in the 1980s and early 1990s, the economic situation of Latin America has shown a significant advance. With a world expansion of 3.8 % in 2006, Latin America has experienced the fourth year of continuous economic expansion with a 5.3 % growth, observing an average of 4.4 % annual growth between 2003 and 2006 (fig. 2). This is a big achievement compared, for instance, with the 2.2 % economic growth the region experienced as an average between 1980 and 2002. The income per inhabitant has grown in this four-year period at an average of 2.8 % p.a., implying an accumulated income of 12 %, a figure that could be reached only after sixteen years with the modest economic growth observed in the period 1980-2002 [1]*.

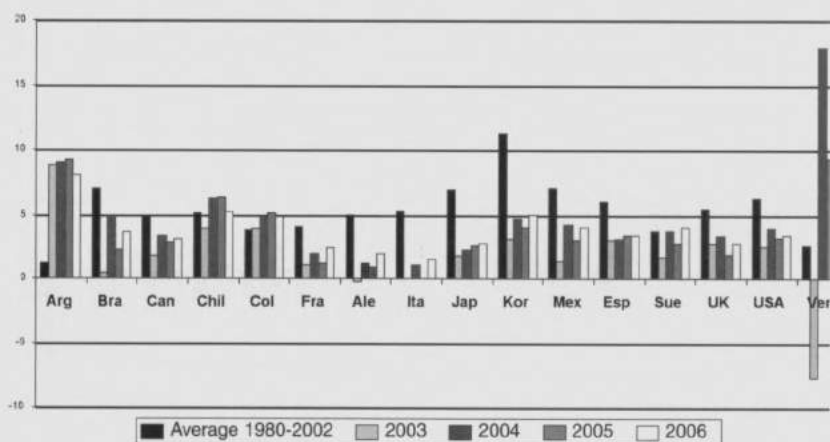


Fig. 2. — GDP growth 1980-2002 and 2003 to 2006 (Source: International Monetary Fund – World Economic Outlook, 2006). This graph includes, for comparison purposes, the following countries: Argentina (Arg); Brazil (Bra); Canada (Can); Chile (Chil); Colombia (Col); France (Fra), Germany (Ale); Italy (Ita); Japan (Jap); Korea (Kor); Mexico (Mex); Spain (Esp); Sweden (Sue); United Kingdom (UK); United States of America (USA) and Venezuela (Ven).

* Numbers in brackets [] refer to the notes and references, pp. 494-495.

It is worth noting that, although Latin American economies are currently experiencing a relatively important expansion, they are still lagging behind relative to other regions such as Asia. As a matter of fact, the average growth rate of developing economies in the past six years (6.5 % p.a.) was much above the recent figures seen in Latin America. By the same token, East Asia (excluding China) has experienced a growth rate of 5.2 % p.a. in the same period. Therefore, the recent achievements of Latin America are still small in comparison with other experiences, although they are indeed quantitatively important relative to the economic history of the region.

In general, Latin America lags behind with regard to its competitiveness to attract new investment, an indispensable prerequisite to make economic growth sustainable. The Global Competitiveness Index [2] prepared by the World Economic Forum (2006) has revealed that the most representative countries of the region (Argentina, Brazil, Colombia, Chile, Mexico and Venezuela) are much disadvantaged compared to the USA-Canada, Europe or Asian economic regions (fig. 3). This disadvantage, as explained by the World Economic Forum, is essentially associated to two relevant aspects: (1) the significant extent of regulations with regard to private business, in connection with taxation, labour and administrative policies, particularly those applied to foreign investment and new businesses in general; (2) the meagre state of human capital formation and the existence of a clearly unsatisfactory system of technological research and innovation. If Latin America was going to enter the world competition in the fields of trade and investment, a turnaround in regulatory policies, as well as in educational and research policies, would be indispensable.

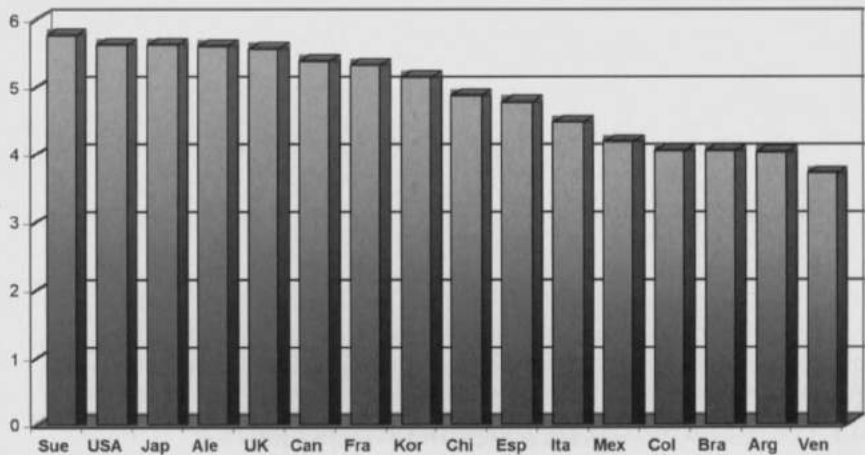


Fig. 3. — Global Competitiveness Index (2005) (Source: "The Global Competitiveness Index 2006" — World Economic Forum).

A relevant question concerns the sustainability of the recently observed economic improvement in Latin America. The region would need to sustain for decades an acceptable growth rate in order to overcome existing social problems, which have been present for many years and somewhat aggravated by the reform effort of the 1980s and 1990s. The region has largely benefited from the significant rise in the price of commodities observed in the past few years, but this is not by itself a sustainable scenario in the longer term. In absence of profound policy reforms, the positive results observed in the macroeconomic situation will only last as long as international prices remain high, thereby implying the danger of a return to the previous situation of low growth, economic instability and stretched social problems.

However, and to a large extent contradicting the historical pace, economic growth in Latin America over the past few years has been accompanied by fiscal discipline, significant accumulation of international reserves, an increase in the rate of investment and, generally, a more stable macroeconomic situation. Inflation rates have been declining whereas the primary fiscal surplus has been on the rise and real wages have experienced moderate increases along with a drop in observed unemployment rates (fig. 4). Everything indicates that the region presents adequate conditions to make economic growth to last beyond the prices windfall. Nonetheless, a key challenge for Latin America to continue in the growth path recently observed is the need of diversifying exports and building up comparative advantages based upon including more added value than the intensive production in natural resources exports. Nowadays the region is able to invest towards a more knowledge-intensive development path, including a change in traditional policies regarding investment in R&D.

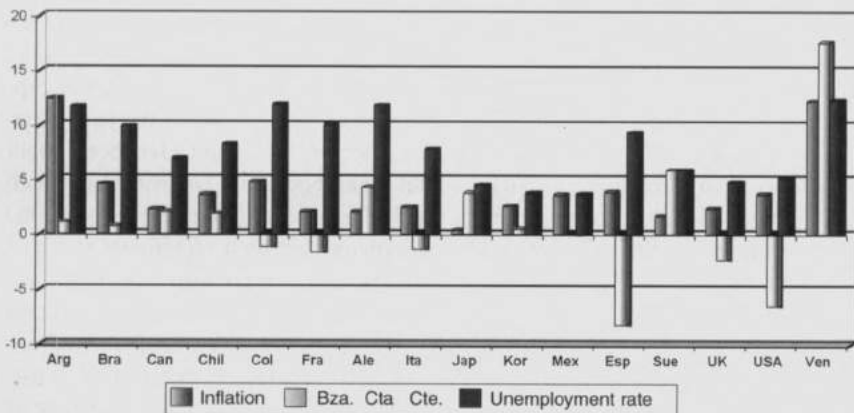


Fig. 4. — Unemployment, inflation and current account balance (2006) (Source: IMF's World Economic Outlook and World Bank's "Key development indicators 2006").

As illustrated by available comparative statistics on exports (fig. 5), Latin America is featured by a very small proportion of exports with high technological content. Only Venezuela and Mexico are in a more comparable situation with respect to industrial economies, and this is mainly due to oil exports and the presence of foreign companies in that industry. In all the cases, and although a notable expansion of “non-traditional exports” has prevailed, which include some more sophisticated manufacturing processes — as is the case of wine, fish, textile, etc. — the technological-innovation component seems to be still quite irrelevant [3].

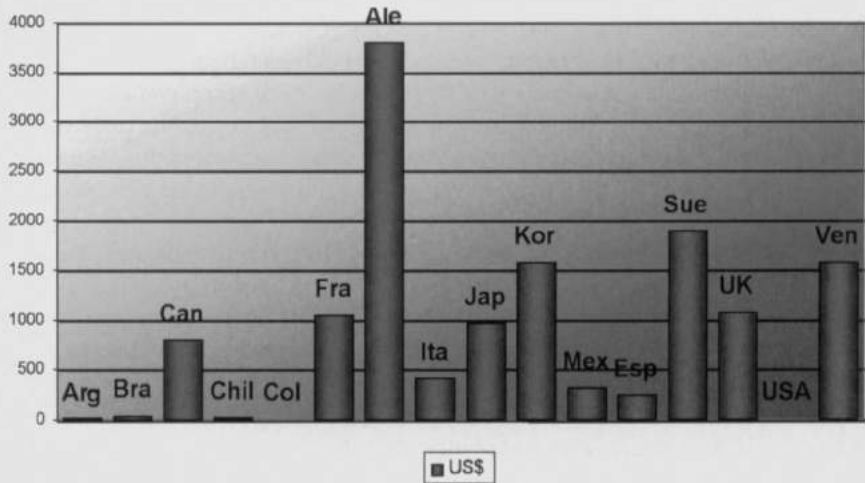


Fig. 5. — Per capita exports with high technology (2004) (Source: World Bank’s “Key development indicators 2006”).

The case of Chile is quite a good example of the challenges that Latin America is facing for the future. Chile has accumulated a significant economic growth, which has more than doubled that observed in the 1950s and 1960s: the per capita income has jumped from about \$2,000 to more than \$8,000 in the past twenty years. As a result of profound economic reforms, the country has been lately characterized by low inflation and a sound macroeconomic environment which has encouraged higher investment rates. With a significant increase in exports, the country presents solid external results, complemented by a significant stock of international reserves. However, Chile is facing, as other countries in the region, questions about sustainability of these economic results. Specifically, Chile needs more research in science and technology to include more added value in its production, diversifying it towards more sophisticated exports than those based in natural resources. The country has now the resources to accomplish the challenge of creating knowledge for a more successful economy in the future through better policies and higher investment rates in R&D+I [4].

2. Where does Latin America Stand with Regard to Scientific Research?

In spite of the significant challenge of sustaining economic development through increasing the added value content of its production and exports, the effort of Latin American countries with regard to scientific research is still wanting. As a proportion of its domestic product the region has historically invested little in R&D+I. In the past decade, for instance, whereas OECD countries used on average more than 2.5 % of their GDP in R&D+I, equivalent figures in Latin America have remained below 1 % of GDP, a proportion that has not significantly changed in spite of observed economic fluctuations, including the more expansionary scenario seen in the past few years (fig. 6). In the case of Chile, for example, a country that experienced an average growth rate of above 6 % in the past fifteen years, the proportion allocated to investment in R&D+I has not changed significantly from the historical 0.6 % of GDP. In general, the yearly investment in R&D+I in Latin America expressed in per capita dollar terms is significantly below the standard established by OECD and Asian countries: a per capita spending of US\$100 or less in Latin American countries compares poorly with the average US\$700 in the case of industrial economies (fig. 7). Given the present technological divide between industrial countries and Latin America, it is possible to predict its enlargement as a result of such a differential in the observed spending in both research and human capital development.

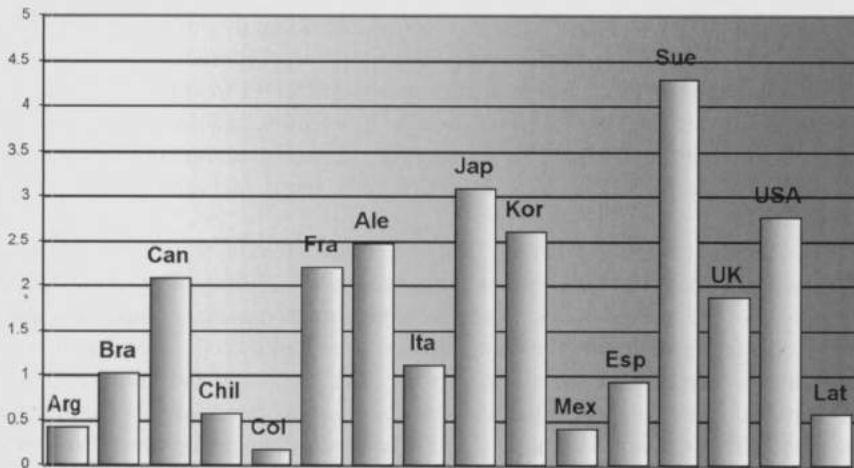


Fig. 6. — Spending in R&D (% of the GDP) (Source: RICYT (International Register of Science and Technology; www.ricyt.edu.ar)).

Two fundamental reasons explain this lack of attention to investing enough in R&D+I in Latin America. First, it is the strong short-run bias of political activity and government practices in these countries. This emphasis on short-run

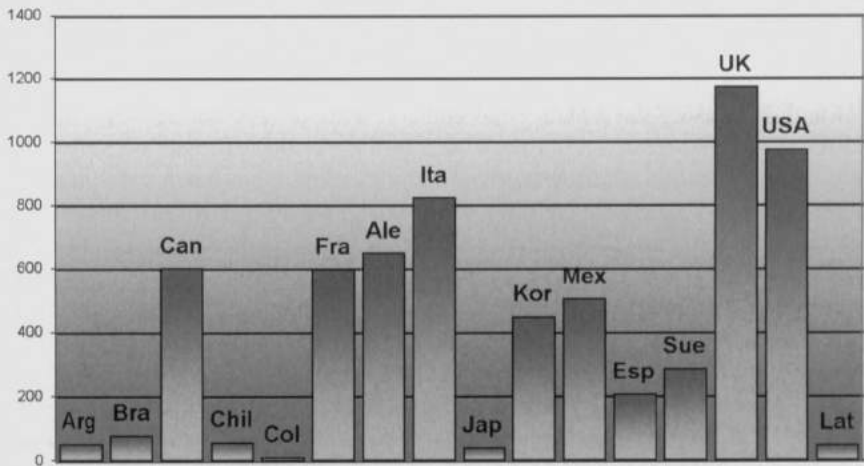


Fig. 7. — Per capita spending in R&D (2001, PPP) (Source: RICYT; PPP = Parity Purchasing Power based on Mexican currency).

results is clearly associated to the extreme political volatility that has characterized most of the XXth century in Latin America, making the concept of long run something quite unaffordable from a typical political standpoint. Contradicting this prevailing view, R&D+I is an investment that normally produces long-term returns and demands a significant previous investment in graduate studies as a prerequisite. Hence a consistent effort regarding R&D+I involves a time span that no politician would be willing to accept. In addition, and due to this prevailing political sentiment, R&D+I is not normally defined as an investment but only as a current expenditure similar to many other items included in the public budget.

A second reason to explain the lack of enough attention to R&D+I in Latin America is associated to the role of economic policies during most of the XXth century. In fact, these policies closed the economy to external competition and prevented the introduction of a competitive culture based on the creation of new knowledge, thereby also prevailing a strong state protection and intervention in all markets, giving support to the idea that R&D+I was essentially a government responsibility. In a world featured by slow technical change and absence of real competition, with exports concentrated in natural resources, the idea of investing in R&D+I seemed to be out of context. Moreover, and given that Latin American universities were the subject of intense political activity during the 1960s and 1970s, their involvement in these issues was weak, making the idea of a bigger effort in R&D+I practically not viable for most policy-makers.

An observation at the output dimension of the scientific research effort in Latin America clearly points what could be anticipated from observed trends in

R&D+I spending. The number of CSI publications produced in Latin America (Inter-American Network on Science and Technology, www.ricyt.edu.ar) is notably small in comparative terms with the industrial world (fig. 8). This is not only true regarding the absolute number of scientific publications, as one would expect, but also considering per capita figures [5] (figs. 9 & 10).

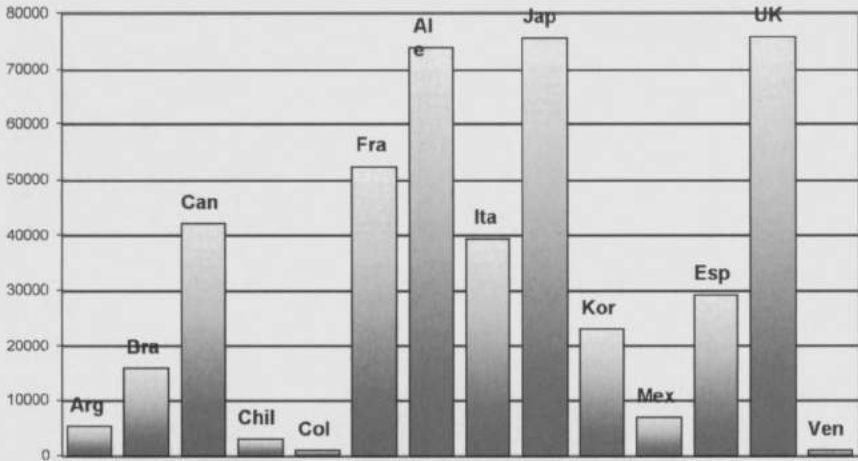


Fig. 8. — CSI publications (2005) (excluding the USA) (Source: RICYT).

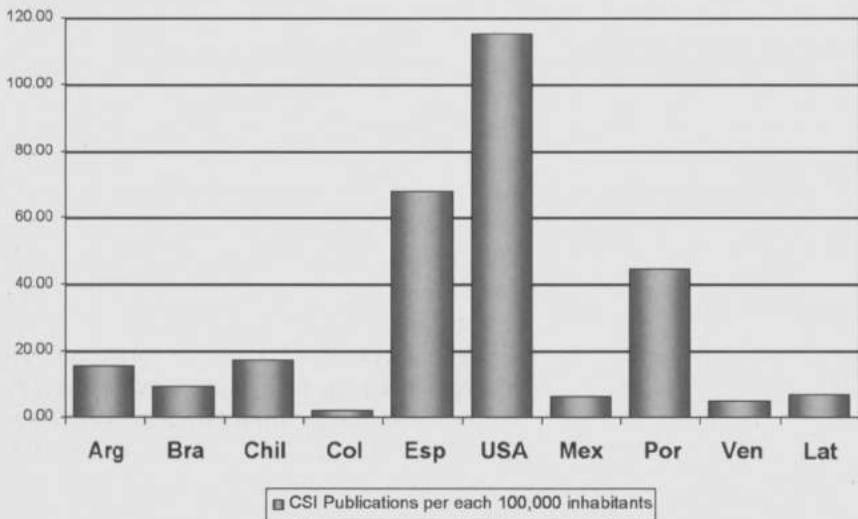


Fig. 9. — Per capita scientific publications (2002) (Sources: RICYT and IMF's World Economic Outlook 2002).

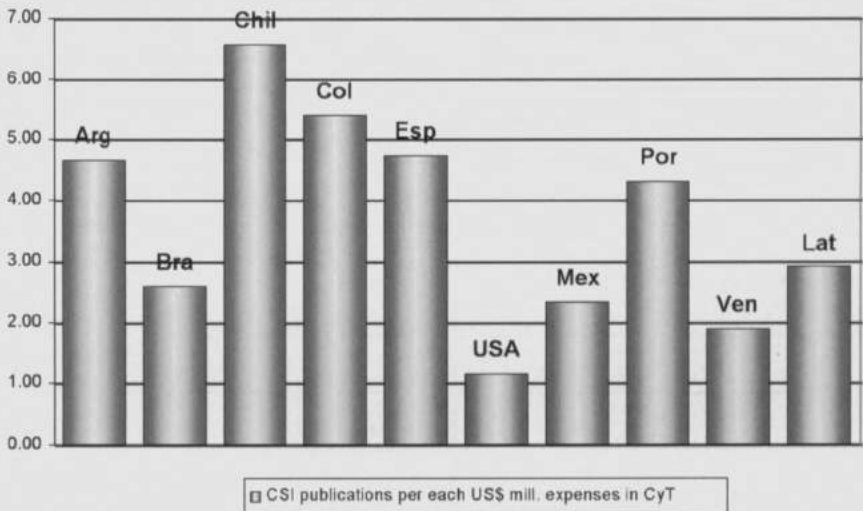


Fig. 10. — Scientific publications relating to R&D expenditure (2001) (Source: RICYT).

Partly as a result of prevailing views about the relevance of R&D+I a low business participation is observed vis-à-vis the financing provided by the government (fig. 11). In general, 80 % of the total spending in R&D in Latin America is public money, which is typically used by public agencies and universities. An active collaborative association between the private firm and the public agency in charge of deciding the spending in R&D+I still appears quite exceptional. This situation has created a significant gap between the observed needs of the productive activity and the occurrence of scientific and technological research financed with public money. The existence of this gap has not produced anything but discouraged a larger private financial contribution to complement government's efforts. Also as a result of these observed tendencies, R&D+I in Latin America has emphasized individualistic research efforts and it has been dominated by a strong bias towards basic sciences, instead of applications and more active links with productive needs.

A culture of disengagement between private business and research activity has been dominant, and it has been prone to a weak link between research and business needs. There prevails a perception among businessmen that university research is mostly theoretical and basically distant from business. This, altogether with the traditional belief that R&D+I is only a government responsibility, leads to a very small commitment of private firms towards financing research. Large firms can develop their own research programmes and link them internationally while public firms and small- and medium-size enterprises are mostly those facing the consequences of a poor research collaboration. The

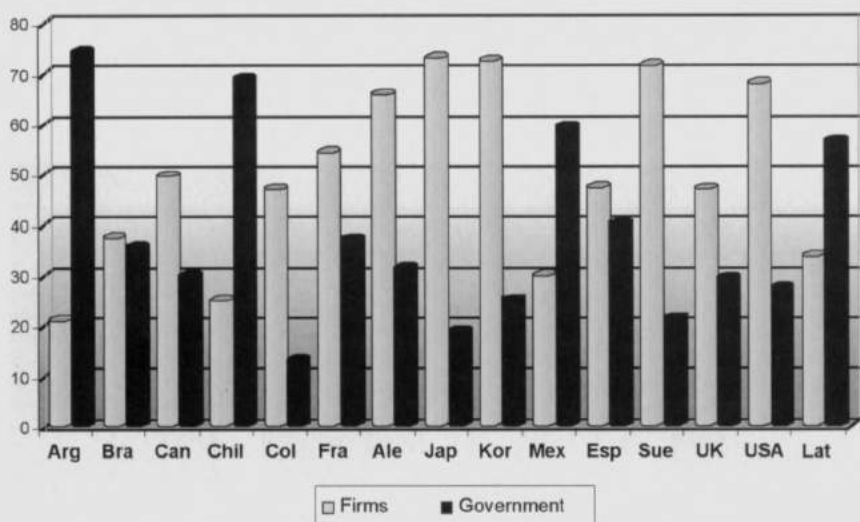


Fig. 11. — Financing of R&D spending (2001) (%) (Source: RICYT).

observed situation has been a reason for the slow flow of technological innovation seen in Latin America, which is evidenced by the rate of patents requested by residents and which ratifies the distance between research and the needs of business development. In this respect it is also worth mentioning that an index of technological research (Global Competitiveness Report 2006-2007), which has an optimal value equal to one and reveals a worse-off situation when the index reaches higher values, assumes a value of 73.5 for Latin America as a whole. For the selected groups of countries formed by Argentina, Brazil, Chile, Colombia, Mexico and Venezuela, this index is equal to 62. The best performer in this regard is Chile, which presents a value of 27 and is therefore the best positioned Latin American country in the World Competitiveness Index in all Latin America.

The basic conditions for carrying more scientific research in Latin America are still in development. Using indicators, such as the number of internet connections or the availability of computer hosts per inhabitant, reveals that Latin America is quite behind OECD countries (figs. 12-14). This is a reflection of the existing economic development gap between industrialized and developing countries, but it is also an impairing factor to produce more and better research to reduce this gap in a dynamic context. Moreover, if one assumes that R&D+I is closely linked to the development of universities and the quality of the research work there performed, this raises an additional point of concern. In fact, according to the World Ranking of Universities prepared by the Jia Tong Institute of Shanghai [6], only seven Latin American universities belong to the group of the

five hundred top universities in the world. This ranking reveals that Latin America represents an insignificant proportion of the world university output, in spite of its population and the fact that universities have been present in this region since colonial times.

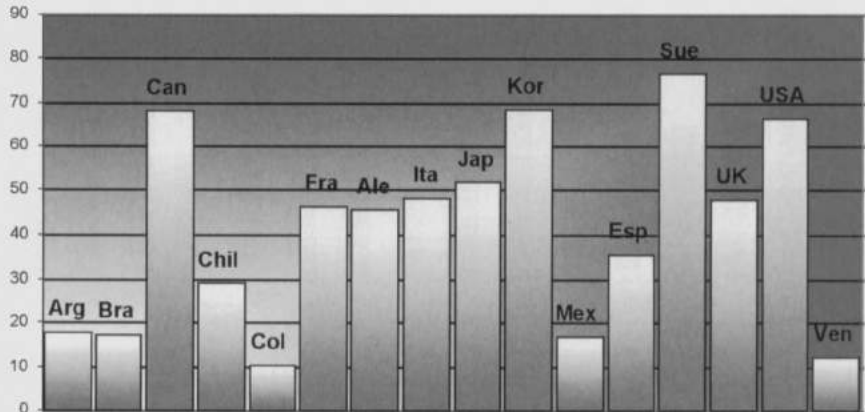


Fig. 12. — Internet users per each 100 inhabitants (2005) (Source: International Telecommunications Union).

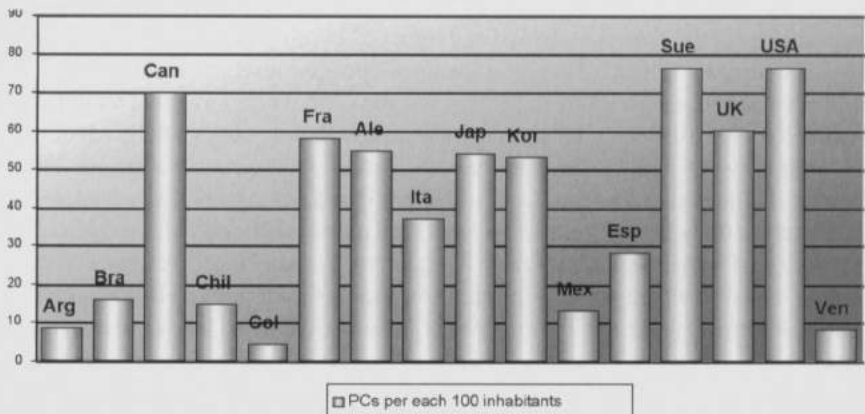


Fig. 13. — PCs per capita (2005) (Source: International Telecommunications Union).

The Latin American record of scientific publications is poor compared to the developed world and even to the recently industrialized Asia. A study prepared by the Unesco [7] indicates that Latin America contributes less than 1.5 % to the world flow of scientific knowledge. Although this is higher than the expenditure of these countries in R&D+I (measured as a proportion of the GDP), which is around 0.6 % on average, and it would demonstrate a positive return, it constitutes a very insignificant contribution to world's knowledge.

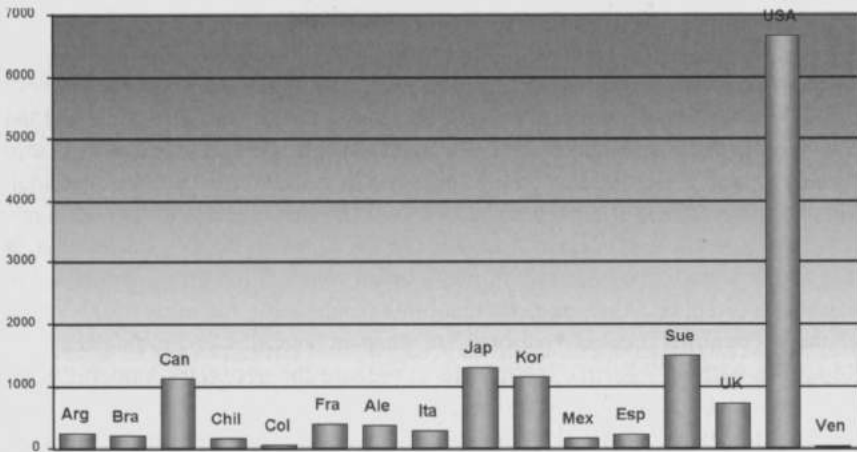


Fig. 14. — Computer hosts per each 10,000 people (2005) (Source: International Telecommunications Union).

Statistics also show that the population of researchers is quite small in Latin America in comparison with that existing in industrial economies. This is for instance observed in relative terms to the population (fig. 15), and reveals the difficulties in building up an adequate critical mass to develop a significant research system. The investment in graduate studies is relatively small, and the situation of research universities is very delicate in the region given the stronger pressures to emphasize undergraduate teaching, which is their fundamental financing mechanism. In addition, there has prevailed a substantial brain drain from all Latin America in favour of several industrial countries, which has caused a relatively dynamic impoverishing process with regard to qualified human capital.

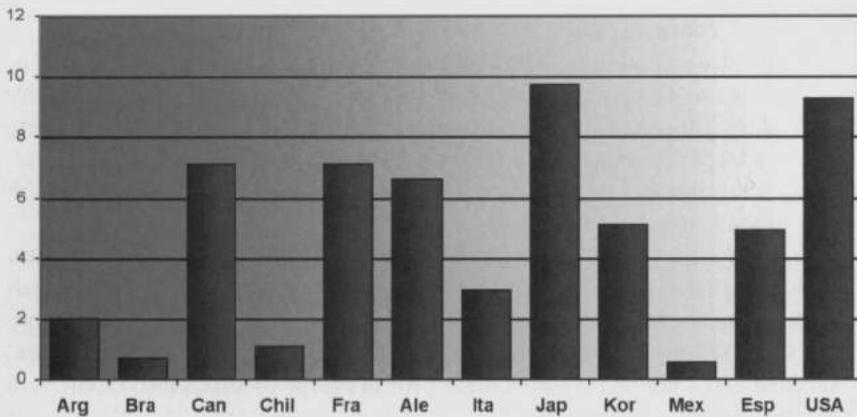


Fig. 15. — Researchers as percentage of population (Source: RICYT).

3. The Situation of Latin American Universities

The Jiao Tong Institute ranking of the top five hundred universities is very coincident with other world rankings such as those of Times Research and the Swiss Federal Government. They all conclude that the contribution of Latin American universities to academic excellence in global terms is quite marginal. This situation cannot be attributed to the likely fact that universities may be a relatively new institution in Latin America. On the contrary, the first universities in this region were founded as part of the Spanish colonization effort as early as in the 1500s or 1600s. Also, after political independence in the early 1800s, most of these countries created “national” or state universities to provide the new Republics with an effective instrument to prepare the necessary human capital and to think about the society and its problems.

Instead of being the result of inexperienced research institutions, the relative underdevelopment of Latin American universities has been the outcome of the interplay of three fundamental elements. First, the emphasis that professional training has acquired a central role for universities, thereby postponing at their inside the importance of research both basic and applied. Secondly, the poor financing of R&D+I and of universities as such [8]. Thirdly, the reliance of most Latin American countries on the developed world, particularly Europe and the USA, to produce the postgraduate training needed for university development, which otherwise would have made necessary a more profound development of research to support acceptable graduate programmes. One of the associated results of this has been the occurrence of a notable brain drain, as host countries may select the best graduate students to develop an academic career.

According to Unesco (see note [7]), the six major Latin American countries (Brazil, Argentina, Mexico, Colombia, Venezuela and Chile) produce 91.5 % of the ISI publications originated in the region. Altogether with this significant disparity, an examination of publications and patent registration show that, relative to industrial countries, Latin America is lagging well behind. In the case of patents, for instance, during 2005 Latin American residents in total requested as much patents as Germany or the USA (fig. 16). This suggests that university research lays little emphasis on innovation and productive applications, a reality which is nonetheless inseparable from the existence of some red tape surrounding the filing process, as the World Economic Forum (2006) indicated with regard to the Competitiveness Index.

The other aspect that is necessary to consider in evaluating research in Latin America is connected with an insufficient organization of the National Research System. In most of the countries the research system is based upon one or more organisms existing at a secondary level inside the civil government structure. Most frequently national research organisms in charge of allocating resources to alternative projects and of policy formulation depend upon the Ministry of Education, where priorities are usually set in managing the schooling system and

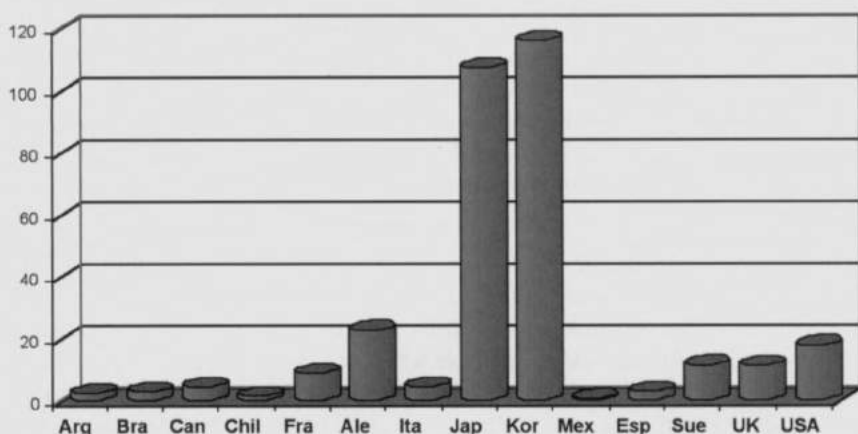


Fig. 16. — Patents requested by residents per US\$ bill PIB (2005) (Source: "Patent Report 2006" – WIPO (World Intellectual Property Organization)).

the teaching activities at universities, but not necessarily in basic or applied research. These organisms, as is the case of Conicyt in Chile, have a public budget which is allocated through a competitive system.

Four are the dominant aspects characterizing research and innovation systems in Latin America:

- There is a predominance of an individualistic, short-run oriented research strategy, given the little money available to support research teams as well as projects with longer-term expected results. Chile has included a correction for this on the basis of its new Millennium projects, which focus on financing research teams for projects developed in a period of up to five years, possibly extended to ten. However, this is still an experiment with relatively small coverage.
- In general, given the small size of the critical mass, competitive systems for project financing lack transparency, leaving little space for new researchers and new research fields.
- There prevails a poor linkage between research and graduate studies; although in many countries there seems to prevail a new approach with regard to this [9], the development of intensive graduate programmes in basic or applied research is generally weak. A Unesco study, for instance, reveals that, on average, for each researcher there is less than one graduate student doing his/her research.
- Although there generally prevails a defective situation, there are some key areas in which the development of a critical mass has been as important as to ensure research production of international quality. This is, for instance, the

case of mathematical modelling, nanotechnology or biotechnology, or even the case of astronomy in several Latin American institutions. However, in contrast, there are areas where there prevails a substantial delay both in terms of not having developed a critical mass or not being able to produce enough relevant output, such as the case of social sciences and the humanities. This segmentation is not prone to a more adequate development of research systems.

In all Latin America almost half of research spending is allocated through universities. The rest is directly allocated through government institutions devoted to research in different disciplinary fields (mining, oil, livestock, environment, etc.), which do not necessarily report in terms of relevant output, not even have periodical evaluations on their impact or relevance. In the case of universities their budget is not generally evaluated in terms of research output, and most usually university researchers are directly paid by government agencies on top of their university pay in financing their specific research projects. Moreover, there is not any specific budget being allocated to university research, given that money is allocated to these institutions in a package that normally involves all sorts of university activities. Most Latin American universities are focused with stronger emphasis on teaching at undergraduate level, given the political pressure to expand the proportion of population attending professional programmes, an initiative that is supposed to be substantially financed with the public budget allocated to them. In addition, given this pressure, political decision-making has favoured the idea of opening the university system to competition, allowing commercial universities to enter the market, with very few regulations, and forcing upon more traditional universities to expand teaching activities at the cost of basic and applied research.

The existence of an ample number of universities in Latin America tells nothing with regard to the research performance of the region as a whole. A Unesco study concludes that the number of researchers is small, and so is the number of universities contributing to research. The study also concludes that the mass of research work is concentrated in no more than thirty universities, of which twenty-seven are public. According to this study, the significant research divide between the industrial world and Latin America is not due to the productivity of the existing research capabilities, but to the relatively small size of the research group, which is competent enough to produce high-quality research. In addition, the study mentions that graduate programmes in Latin America are too small and expensive, and therefore unable to adequately provide replacement to the existing academic staff.

In general, all these problems are clearly derived from the low investment done by Latin American countries in R&D+I and in university financing. It is not acceptable that a continent with a population which is fifteen times that of Canada spends only a little bit more than Canada in R&D (Unesco 1999).

4. Concluding Remarks: How Can Europe Help Latin America through a Partnership for Science & Technology Development?

There are two categories of problems regarding the situation of Latin America with respect to R&D+I. First, the public policy design does not allow a further development of R&D+I activities. Secondly, the need for a larger partnership to support disciplinary areas in which R&D+I policies can be more successfully implemented in Latin America. In both regards a possible stronger association with the European Community seems to be potentially important.

In the first area, it is clear enough that the level of spending in R&D+I is insufficient to adequately sustain the development of any solid research system. Latin America should be spending at least 1 % or 2 % of GDP in R&D+I, a proportion which would mean more than doubling the current expenditure. In support of this effort, it appears clearly enough that the region needs to increase research efforts to produce applications enhancing the added value content of its production and exports. This is a fundamental aspect for these countries to make recent growth rates sustainable throughout time, as well as to reach a more sustainable development path.

The increase in R&D expenditure is a political decision that has to be adopted with a longer-run view. However, although this is a crucial decision, it would not be enough by itself to solve observed problems regarding the productivity of the R&D+I system in Latin America. The process of financial allocation and the institutional organization of research systems in Latin America need to be crucially reformed, as there prevail problems regarding the design of adequate instruments to spend more effectively and with adequate incentives. There are several issues at stake in this regard. First, there is the need of creating better incentives (tax incentives for instance) for the involvement of private firms in financing R&D+I directly or through institutes or universities. Secondly, there is a need of improving the present system of financial allocation to scientific research by establishing priority areas, supporting research teams and giving more consideration to projects of longer duration, while also improving control mechanisms and accountability. Thirdly, it is urgent to open competitive systems to research projects counting with external reviewers so as to ensure quality and to avoid conflict of interest which is undeniably a problem given the small population of researchers in these countries. In this last regard, the collaboration of European academicians would be extremely welcome, this being a field of collaboration that needs to be urgently developed.

With regard to the need of identifying areas in which Latin American countries can develop comparative advantages in research, the collaboration of Europe is very important. It is probably true that countries in this region cannot develop enough competitive advantages in basic science. Considering this, the collaboration with European research teams can be extremely valuable, because basic science is necessary to develop applied research, a field in which Latin

America may develop competitive advantages. As applied scientific research is closer to the real needs of Latin America, in terms of developing applications and a more active connection with the industry, the strategic association with Europe with regard to basic research would be extremely valuable.

Given the relative scarcity of financial resources that overshadows the development of both basic and applied research in Latin America, the selection of topics is a very important issue. In this regard, Latin American countries should start a more active collaboration between themselves, as this will allow a more efficient use of available resources. For this purpose, the collaboration with Europe should also be important because the integration of national research systems could be better coordinated on the basis of an external player. At the same time, a collaboration with Europe should be aimed at minimizing the brain drain that has affected Latin America as a result of its international insertion.

A third important area in which Europe can collaborate with Latin America in further developing necessary fields of research, is in connection with social sciences and the humanities. As said above, this is the area which is suffering more from the scarcity of financial resources and the disadvantages surrounding university development. These disciplinary fields need to be supported through adequate graduate training and the access to financing by means of joint research activities.

European experience regarding policy design with respect to R&D and installing adequate incentives to encourage its development, is an experience of which Latin America can benefit in a very significant way. Altogether with a more active collaboration in the above-mentioned fields, this can help significantly to improve the situation in a region which is urgently in need of sustainable growth and an improvement in the income distribution, objectives to which research and human capital development can contribute quite significantly.

NOTES AND REFERENCES

- [1] During the expansion occurred over the past four years, terms of trade for Latin America have increased by 7 %, conveying an export growth of more than 8 % p.a. in the period 2003-2006, which is more than one percentage point above the situation observed in 1991-1994.
- [2] This index includes variables regarding education, macroeconomic indicators, innovation, market efficiency and institutions, technological readiness, infrastructure and business sophistication.
- [3] Exports are clearly in need of including greater added value to attain a sustainable outward-oriented production. A sustainable development strategy for Latin America necessarily demands the development of more applied research and innovation.
- [4] R&D+I: Research, Development and Innovation, a concept that follows the most accepted language prevailing in this field of analysis.
- [5] If, however, the cost dimension is included in this analysis, and scientific publications are deflated by the corresponding expenditure level in R&D, it appears a lower

cost of scientific production for Latin America than for its industrial counterparts (see fig. 10).

- [6] The preparation of this ranking gives very heavy weight to the research production of universities, specially through the ISI publications and the citation index.
- [7] J.-P. Lemasson & M. Chiappe, *La Investigación Universitaria en América Latina*, Ed. IESALC-Unesco, 1999.
- [8] The political target of most Latin American governments has been to significantly increase the proportion of people attending undergraduate programmes, an initiative which lately has been completed by an explicit policy aimed at encouraging the development of new private universities only concentrated in teaching activities.
- [9] This argument is presented by C. Rama, in *La Educación Superior en América Latina y el Caribe, 2000-2005* (IESALC-Unesco, 2006).

Las "Conquistas" en la novela histórica argentina*

por

María Rosa LOJO**

KEYWORDS. — Argentina; Conquests; Historical Novel; Non-White Culture.

SUMMARY. — *The "Conquests" in the Argentine Historical Novel.* — In this work, Argentina and Hispanoamerican novel are viewed from my double experience as a writer and a researcher. Usually in Argentina, the canonical foundational novel is apart from indigenism (quite differently from the other Latin American countries) and is built on a national image that tends to diminish or ignore the native roots. Nonetheless, there are perspectives (the one shared, for example, by the first female writers) that compensate this excluding insight. During the XXth century, and mostly since its second half, historical narrative has revived and has renewed, both aesthetically and ideologically. The Discovery's commemoration is linked to the proliferation of novels that have in common a marked critical position towards this fact, seen from Latin America above all as a «Veiling» (and devastation) of native conquered cultures. In Argentina, more than the novels about the Conquest or Colonial period, many are those dedicated to the Independence period and civil wars. There are also those referring to another type of conquest war (the borders' war) which, in the last quarter of the XIXth century, annihilated the last belligerent indigenous populations from the centre and south of the country. The "Civilization/Barbarism" dichotomy, proposed by Domingo F. Sarmiento, and the political use of the ideal of Progress (united to the postulate of white race superiority) are discussed in many of these new novels. Their aim is the recovery, for national memory, of non-white (Indian and African) ethnical groups and the recognition of a specific, not only racial but culturally hybrid, identity capable of an excentric vision towards the West.

Historia, ficción y grupos étnicos en las novelas canónicas fundadoras

La novela registra una aparición relativamente tardía en América Latina, ligada a los conflictivos procesos independentistas de las antiguas colonias españo-

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** Escritora (novelista), Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina). Prof. Universidad del Salvador, Instituto de Literatura Argentina "Ricardo Rojas", Facultad de Filosofía y Letras, UBA, calle 25 de Mayo 217, (1003) Buenos Aires (Argentina).

las. Literatura y política, prensa y política se hacen en este período, inseparables (SOMMER 1993, BOCCO 2004). La literatura, profundamente intrincada con el periodismo, se vuelve un medio de *hacer política*. En el Río de la Plata, la innovadora poesía gauchesca se publica (como las demás ficciones, por otra parte) ante todo en los diarios y gacetas de la época, y es un arma decisiva de combate y de polémica.

El debate y el *uso* político de la ficción, así como la facultad y la misión de *transmitir/interpretar la Historia*, se adscriben desde los comienzos al género novelesco. Las novelas o “romances” ya habían comenzado a llegar de Europa a Buenos Aires por lo menos desde finales de la década de 1820, según consta en el catálogo de la librería *Duportail Hermanos*, del año 1829. Alejandro Parada llama la atención sobre la “gran variedad de novelas, fundamentalmente de procedencia francesa, inglesa y alemana” (PARADA 2005, p. 40); las francesas ocupaban el 25 % del catálogo. Los mejores exponentes del Romanticismo arribaron a la ciudad sin grandes desfasajes cronológicos, junto a colecciones económicas de novela sentimental (BATTICUORE 2005, pp. 44-45). Otro asunto era, empero, la *legitimación*, tanto de la lectura como de la escritura de este tipo de libros. Bien señala Hebe MOLINA (2006) la dificultad que las preceptivas de la época (las de moral y las de retórica) tienen para aceptar el concepto mismo de ficción en un sentido puro. Los escritores locales suelen abundar en paratextos donde se intenta convencer al público de que se han basado en “hechos verídicos”. La novela se refugia tras el parapeto de la Historia (al menos, de lo que se cree confirmado por la historiografía vigente), y se escuda en protestas de intachable moral. Tanto se valora el prestigio de la fortaleza historiográfica, con sus proclamas de objetividad, que uno de los primeros novelistas argentinos, José Mármol, define y plantea engañosamente su *Amalia* (1851/1855 [1]*) como novela histórica, aunque se refería a hechos muy cercanos en el tiempo, y aunque se trataba de un texto de intenciones ardorosamente panfletarias dirigido desde el exilio como arma política de uso inmediato contra el gobernador de Buenos Aires (Juan Manuel de Rosas) que aun se mantenía en el poder.

La alianza de Historia y Ficción, o el enmascaramiento de la peligrosa “ficción” bajo la tranquilizadora seriedad de la Historia, a la que se le achaca una función ejemplarizante y didáctica, suele ser común a las novelas fundacionales de América Latina, interpretadas frecuentemente por la crítica como alegorías nacionales. Aunque este tipo de interpretación se aplica a veces en una forma demasiado mecánica que suele obviar otros rasgos también existentes, es aceptable en términos generales. Alegóricos o no tanto, los textos liminares acompañan y promueven los procesos de formación de la nacionalidad.

Dentro de esta novelística predominan las historias de pacto político y de conciliación interracial. Un claro ejemplo lo da el Brasil con textos canónicos

* Los números entre corchetes [] se refieren a las notas y referencias, pp. 506-508.

como *El Guaraní* (1857), e *Iracema* (1865), de José de Alencar. El indianismo o el indigenismo permean muchas primeras novelas de las repúblicas hispanoamericanas, donde “los artistas se volvieron hacia quien simbolizaba como nadie el origen de sus naciones: el indígena” (GONZÁLEZ ACOSTA 2000, p. 49), en general con propósitos idealizantes [2].

Las obras canónicas de la Argentina decimonónica suelen dejar en cambio fuera del imaginario fundador a las etnias aborígenes, descritas literariamente con características inhumanas y feroces durante todo el siglo XIX (BIAGINI 1980, p. 52), y, en general, a las etnias no blancas. Los africanos son vistos como seres degradados y animalizados, sometidos a la voluntad de Rosas, en *Amalia* y en *El Matadero* (1871) [3], de Esteban Echeverría. Por cierto que tampoco los gauchos tienen buena prensa para estos intelectuales de la generación del '37 [4], aunque no puede negarse que Sarmiento en su *Facundo* (1845) — texto que sería injusto reducir sólo a sus tesis políticas — encuentra en el fascinante caudillo riojano Juan Facundo Quiroga, concebido allí como modelo de gauchos y líder popular, un verdadero paradigma antropológico argentino [5]. De todas maneras, el gaucho (enfaticando sus rasgos españoles y minimizando los indígenas) será elevado más tarde a la categoría de héroe civilizador por Leopoldo Lugones, en las conferencias reunidas en *El Payador* (1916). No ocurrirá lo mismo con los afroargentinos (prácticamente borrados de la memoria colectiva), ni con los indios. Hacia fines del siglo XIX y principios del XX, el endurecimiento de la mentalidad positivista cuajaba en condenatorias expresiones como las del viejo Sarmiento (en *Conflicto y armonías de las razas en América*) o las de José Ingenieros (quien, sin embargo, profesaba el socialismo) en su *Sociología Argentina* [6]: textos que, siguiendo una visión ya explicitada en el '37, consideran como una verdadera rémora los elementos étnicos no blancos que integran el espectro poblacional de América Latina [7] y de la Argentina en particular.

Otra visión de los aborígenes en la novela histórica argentina no canónica del siglo XIX. Las *Lucía Miranda* de 1860

En el año 1860 sucede un hecho curioso: se publican en la Argentina dos novelas casi del mismo título: *Lucía Miranda* y *Lucía*, escritas por dos mujeres: respectivamente, Rosa Guerra y Eduarda Mansilla. Ninguna de estas dos obras se convertirá en canónica. Las escritoras, recién aparecidas en el horizonte de la literatura nacional, eran vistas más bien como una anomalía y una rareza, y puede decirse que aun las autoras contemporáneas continúan — desde el punto de vista del canon — en una posición marginal (LOJO 2006b). Los dos textos reactualizan (por primera vez en forma de novela) un verdadero “mito de origen” plasmado en la crónica fundacional rioplatense *Anales del descubrimiento, población y conquista de las Provincias del Río de la Plata* (concluida hacia 1612), obra que se conoció luego — por su modo de circulación — como “La

Argentina manuscrita" [8]. Debida a la buena pluma del militar y funcionario Ruy Díaz de Guzmán, nacido en Asunción (hoy Paraguay), esta crónica contiene, entre muchos otros relatos, uno que atañe a la fundación del primer asentamiento español en la región del Río de la Plata, llevada a cabo por la expedición de Sebastián Caboto en 1527. La guerra desatada entre los españoles y los aborígenes de la etnia guaraní que poblaba la zona (los timbúes) y que terminó con la destrucción del Fuerte Sancti Spiritus y el regreso a España de los sobrevivientes, adquiere aquí — como en la *Ilíada* — las características de una batalla motivada por la rivalidad amorosa. Después de pintar una convivencia relativamente idílica entre españoles y timbúes, el origen de la discordia se atribuye al "desordenado amor" que el cacique timbú Mangoré comienza a sentir por Lucía de Miranda, esposa de Sebastián Hurtado. Si bien no recibe correspondencia de parte de la dama española, Mangoré, cegado por la pasión, se propone raptarla y convence a Siripó, su hermano, para que asalten el Fuerte, cosa que perpetran gracias al ardid del presente griego (en vez del caballo de madera, víveres llevados por una comitiva que franquea el acceso a los españoles emboscados afuera). Aunque Mangoré muere en el combate, Lucía no se ve libre del asedio porque Siripó también cae víctima del mismo desenfrenado amor. La española, cautiva, accede a casarse con Siripó a cambio de la vida de su esposo Sebastián, que podrá tomar otra esposa indígena. Sin embargo, los antiguos cónyuges vuelven a encontrarse ocultamente, y la traición es denunciada a Siripó por su anterior mujer, repudiada al unirse éste a Lucía. Ante la evidencia, Lucía y Sebastián son ejecutados como verdaderos mártires y mueren pidiendo a Dios el perdón de sus pecados.

La historia de los fieles esposos cristianos, aunque se presenta como un hecho realmente ocurrido relatado al cronista, no cuenta con apoyo documental. La expedición de Caboto no llevaba mujeres; los nombres mencionados por Ruy Díaz — tanto de españoles como de caciques indígenas — no constan en papeles de la época. De todas maneras, no es esto lo importante sino la extensísima repercusión (en otras crónicas, en poemas, en obras de teatro, en novelas) que este "mito de origen" (tenido mucho tiempo por histórico), alcanzará, hasta entrado el siglo XX [9].

Hacia 1860 la composición étnica y la organización política y jurídica de la Argentina era objeto de ásperos debates. En los años que siguieron a la caída de Rosas (acaecida en 1852) se había buscado — afanosamente y sin lograrlo — implementar un proyecto nacional que concitara el acuerdo de todos los sectores sociales, de las provincias y de Buenos Aires. Los indígenas eran parte gravitante de la cuestión, puesto que vastas comunidades de origen mapuche y tehuelche, desechas las alianzas que habían mantenido con Rosas, presentaban activa beligerancia en el centro y sur argentinos. Esos indígenas ¿podían tener un lugar en el país moderno integrado en futuros acuerdos comerciales y culturales con las naciones europeas, que muchos soñaban para el futuro?, ¿había que exterminarlos como a extraños e invasores, o reconocerles la prerrogativa de co-fundadores

de la nación?, ¿se volvería a los intentos de seducción y de reconocimiento de derechos que se había intentado con ellos en los albores de la Independencia, o sería mejor — no bien se pudiera — emprender una ofensiva no sólo de conquista, sino de exterminio? Sabemos que en la Argentina fue la segunda alternativa la que triunfó, con otra “Conquista”: la llamada “Conquista del desierto” o “Campaña al desierto”, bajo las órdenes del general Julio A. Roca (luego presidente de la República por dos veces) que comenzó de manera fulminante en 1879, y cuya última batalla se libró en 1884.

En las *Lucías* de 1860 es otra la actitud que prevalece. Los aborígenes de las dos novelas pertenecen plenamente a la condición humana y están dotados de valiosas cualidades naturales. Aunque se reconoce superioridad a la cultura europea, sobre todo en lo que hace a la evangelización (que libraría a los indígenas del yugo de las supersticiones, como se ve especialmente en el duelo de la Lucía Miranda de Mansilla con el brujo Gachemané), no dejan de censurar a ambas narradoras la violencia y la ambición que también han animado la Conquista española. Eduarda no se priva de referirse al mal trato habitual sufrido por los “desgraciados habitantes del Nuevo Mundo” (LOJO 2007, p. 307), ni a los “indolentes Españoles” (*ibid.*), que pretenden obtener grandes riquezas sin ningún trabajo. Rosa Guerra, si bien destaca “la infame actitud de los Timbúes” que termina la amistad con los españoles, no deja de admitir, repitiendo al deán Gregorio Funes, que “si la causa de la humanidad hubiera entrado directamente en el proyecto de estas empresas [las de conquista] hubieran sido menos desgraciadas” (GUERRA 1956, p. 77).

De las dos novelas, la de Mansilla es la que más carácter “histórico” detenta. El texto denota un trabajo minucioso de investigación y documentación. La joven autora (contaba sólo con veintiséis años cuando la novela fue publicada) exhibe no sólo amplios conocimientos literarios — como se advierte en citas internas y en los epígrafes de los capítulos — sino historiográficos y antropológicos, lo que le permite reconstruir con apreciable verosimilitud, en la primera parte, la España Imperial de Carlos V, y en la segunda, el mundo pampeano donde viven los timbúes. La novela de Guerra cuida menos del verosímil, pero da un paso adelante en cuanto a audacia erótica. A pesar de la fuerte restricción que la moral de la época (y no tanto los prejuicios raciales, como se ha insistido por demás) imponía al adulterio, su Lucía, muy atraída por la apostura y gentileza del cacique Mangora, no sólo se deja besar por éste (aunque estando decorosamente desmayada), sino que llega a confesar, en algún momento, y cuando el cacique ya no representa peligro porque ha muerto: “Si Sebastián no hubiera sido mi marido, yo habría sido la esposa de Mangora” (GUERRA 1956, p. 63).

El personaje femenino más interesante es, empero, el diseñado por Mansilla. Su Lucía, cuyo pasado en España se amplifica enormemente con respecto al episodio de Ruy Díaz, es una heroína de marcada personalidad que construye su propio destino, y que — en su función de intérprete, educadora y transmisora de prácticas culturales en las Indias — excede la importancia de la función épica

varonil, que cae, en determinados momentos, bajo la crítica: “dura ley — dice Lucía refiriéndose a la de la guerra — que convierte en terrible y desapiadado al mejor de los hombres” (Lojo 2007, p. 294) y de la que por fortuna están exentas las mujeres. Mangora o Mangoré, por otra parte, aparece en ambas novelas (particularmente la de Mansilla) como más cercano a la percepción sensitiva propia del mundo femenino que los rudos varones españoles. La voz narradora, en la novela de Mansilla, se pliega por momentos a la apasionada utopía de libertad que otorga sublime grandeza al “hijo del desierto” (Lojo 2007, p. 348). La capacidad de cruzar psicológicamente del lado de los llamados bárbaros, de colocarse en el lugar de quien es considerado bárbaro, es ejercida en la Argentina del siglo XIX, casi sólo por las escritoras mujeres [10], con una excepción: la del hermano de Eduarda, Lucio Victorio, en su famosa *Una excursión a los indios ranqueles* (1870) (Lojo 2005a). Cabe señalar otra cercanía entre la heroína mansilliana y los “bárbaros” o los no cristianos. La Lucía creada por Eduarda es además una mestiza, fruto del amor clandestino de una bella morisca y de don Alfonso de Miranda.

Aunque la pasión pecaminosa por una mujer casada no podía sino terminar en tragedia dentro de una novela romántica rioplatense, cabe señalar que esta tragedia no clausura las posibilidades de amor interétnico legítimo para otros. Anté, la ahijada timbú de Lucía, y su prometido español, Alejo, sobreviven a la masacre y escapan hacia el espacio abierto de la pampa, que no se ve aquí como intemperie y desamparo sino como refugio protector. Las Indias son, en definitiva, el ámbito que permite desarrollar posibilidades negadas en Europa, y en especial en una España agitada por las disensiones internas, donde los mejores hombres, como el Gran Capitán Gonzalo de Córdoba, son objeto de la ingratitude, o donde los religiosos de verdadera vocación (como Fray Pablo) quieren huir de las envidias y rencillas de los monasterios (Lojo 2007, p. 219).

Otras versiones de la primera Conquista

Pródiga en novelas históricas sobre la Independencia, las guerras civiles argentinas y la época de Rosas (Lojo 2001a), la literatura argentina no abunda, en cambio, en textos que tomen el tema de la Conquista española, quizá porque, como alguna vez dijera Borges, la historia argentina es la historia de un “voluntario distanciamiento de España”. Pero mencionaremos algunos títulos significativos [11]. *La gloria de don Ramiro* (1908), gran novela modernista de Enrique Larreta, se sitúa en la España de Felipe II, y sólo hacia el final del relato (en un epílogo bastante discutido, por lo abrupto) aparece el espacio de unas Indias ya hace tiempo conquistadas, donde don Ramiro — después de haberse dedicado a robar y a torturar caciques — podrá purgar sus culpas nuevas y viejas y redimirse de sus pecados gracias a la irradiante influencia de la futura Santa Rosa de Lima. Conocedor y admirador del arte y de la literatura españolas (su casa es hoy

sede del Museo de Arte Español de Buenos Aires), Larreta, a pesar de cuanto se haya dicho de su hispanismo, no idealiza ni reivindica en su novela la política de la España Imperial, ni la externa — hacia las colonias — ni la interna. La España de la que forma parte don Ramiro, cuando su padre le revela su verdadero origen (es el bastardo de una dama castellana y de un moro), está asolada por las deudas y la miseria, y gobernada por la mano inflexible de un rey absoluto. Es también una nación mutilada, que ha expulsado de sí a judíos y moros. Sobre estos últimos se vuelcan especialmente las simpatías del narrador que, junto con los lectores, sabe desde el principio lo que Ramiro ignora, y proyecta así una ironía trágica sobre todos sus actos de traición y fanatismo. No podemos dejar de mencionar la última *Lucía Miranda* (1929) escrita por el popular novelista Hugo Wast [12], autor por cierto ultracatólico e hispanizante, proclive a rescatar la Conquista como empresa épica (aunque no deja de apuntar a crueldades e injusticias cometidas contra los indios) y la superioridad de la cultura cristiana. Pero su *Lucía* es, sobre todo, una novela decididamente feminista en la que las grandes heroínas son las mujeres, tanto blancas como indígenas, no sólo hermosas, sino capaces de inteligencia y de valor extraordinario.

En los años 1980 asistimos a un significativo *revival* de la narrativa histórica desde ejes temáticos y procedimientos novelescos diversos. El tema de la Conquista resurge de la mano de algunos autores: de manera central en los libros de Abel Posse (*Daimón*, y *Los perros del Paraíso*; también en *El último atardecer del caminante* [13]), y en *Río de las congojas* (1981), de Libertad Demitrópulos, que cuenta la gesta oculta de las fundadoras de la nueva sociedad, españolas e indígenas. De manera más tangencial, emerge en *El entonado* (1983), de Juan José Saer, que deriva hacia una reflexión metafísica sobre la transculturación, la memoria y el lenguaje, en la experiencia, narrada con gran vuelo poético, de un cautivo de los indios. Alguna novela más próxima, como *El oro de los Césares* (1996), de Julio Torres, toma la historia de un personaje puntual: Jerónimo Luis de Cabrera, fundador de la Córdoba de la Nueva Andalucía en territorio argentino, pero lo utiliza como pivote para trazar un vastísimo y paródico fresco del siglo XVI. Con una técnica basada en la invención de metáforas chocantes, originales y revulsivas, y en la combinación audaz de los registros lingüísticos más dispares, como el lunfardo actual y el lenguaje cortesano, Torres presenta los mundos de Oriente y Occidente en un vértigo de cajas chinas, desde lo grande a lo pequeño. Un hilo conductor une los extremos: las ratas y la peste que éstas difunden y que, por los caminos más azarosos alcanza a todos, así como el mal humano llega a todas partes porque nace por doquier. La exhibición satírica de la loca sed de gloria y de riquezas que empuja la Conquista no implica, empero, la idealización contrapuesta de otros imperios como los americanos. La lucha fratricida de Huáscar y Atahualpa, la opresión de los pueblos avasallados por el poder del Inca, se dibuja en paralelo a las luchas internas de España, a las guerras entre los conquistadores, a la expulsión y persecución de los moros y judíos en el territorio español [14]. Pero si los males destruyen,

también crean. La “olla podrida” de etnias y culturas que es España, y que se intenta en vano “depurar” continuará en América. Jerónimo Luis de Cabrera, hijo bastardo de un caballero andaluz y de la hermosa judía Marfa de Toledo, atormentado hasta el final por borrar su origen espurio, no es un caso aislado, sino un paradigma de las mezclas y la ilegimitidad que en las Indias se llevará hasta la exasperación, y que resulta ser, por el contrario, quizá la mayor riqueza del Nuevo Mundo y de la Argentina [15].

La novela contemporánea y la última “conquista”. El Sur. Poéticas del fin del mundo

En el último cuarto de siglo se han escrito y difundido con éxito novelas sobre las últimas “Conquistas”: la de Roca (y sus preliminares), que pone fin a la guerra secular de fronteras mantenida especialmente en la pampa central argentina, y la conquista del Sur patagónico y de la Tierra del Fuego, debida no ya sólo a los criollos descendientes de españoles, sino a la acción de otro imperio: el británico, con fuertes intereses económicos y políticos sobre la región. Este enfoque es concomitante con la reformulación de las imágenes estereotipadas de los aborígenes en la literatura canónica y el resurgimiento literario de las etnias negadas y olvidadas (Lojo 2006a), tanto los aborígenes como los afroargentinos. También coincide con la consolidación, en la opinión pública, de un nuevo juicio sobre estas acciones bélicas, consideradas — en especial después de la última dictadura militar — mucho más como genocidio de los pueblos originarios que como empresa civilizadora y “patriótica” [16].

La novelización de la llamada “Conquista del Desierto” no carece por cierto de antecedentes en la literatura argentina, ya desde Estanislao Zeballos, político y jurista, promotor de la Campaña de Roca, explorador científico y autor de libros de ensayo y novela [17] sobre los pueblos indígenas del Sur. Pero habrá que esperar al siglo XX para que esta producción comience a ser significativa, y hasta después de su segunda mitad para que la imagen de estos aborígenes, cristalizada en las figuras brutales presentes en *Martín Fierro* (1872) o en *La Cautiva* (1837), comience a adquirir otros matices y a ocupar papeles protagónicos.

Dado que mi participación en este panel se pensó también en calidad de escritora, hablaré brevemente de mi postura al respecto como novelista comprometida con la reescritura de la guerra de fronteras y sus consecuencias. Mi última novela: *Finisterre* (2005) [18] es en buena parte el cierre de un ciclo que comenzó con *La pasión de los nómades* (1994). Una saga de la pampa central argentina como escenario de guerras despiadadas por el poder y la identidad, como lugar de encuentros y de alianzas, de la interpenetración de las culturas y de los cuerpos, y finalmente de exterminio (aunque no definitivo) de la cultura dominada por la dominante. Tres libros, sobre todo, componen ese ciclo: *La*

pasión de los nómades, *La princesa federal* (1998), y *Finisterre*, además de no pocos cuentos de *Historias ocultas en la Recoleta* (2000) y de *Amores insólitos* (2001) [19]. *Finisterre* transcurre en el siglo XIX, y entrelaza un relato epistolar que evoca el pasado a partir de 1835 — en cartas que llegan desde el cabo de Finisterre (en Galicia) hasta Londres, prometiendo revelarle sus orígenes rioplatenses a su joven destinataria — con el presente de 1874 en el que vive la muchacha inglesa. En esta novela sobre la construcción de la identidad individual y colectiva reaparecen personajes históricos de otras novelas propias, como Manuela, la “princesa” del partido federal, hija de Rosas en su exilio inglés, o Manuel Baigorria (*La pasión de los nómades*), unitario refugiado entre los indios ranqueles durante las guerras civiles, y surgen otros nuevos, totalmente ficticios: las cautivas españolas doña Ana y Rosalind, que escribe su historia en las cartas de Finisterre. Todos ellos se ven obligados a extrañarse de su mundo propio y rehacerse en un mundo distinto y distante. En este texto llegan a su culminación las tensiones ya planteadas en mis libros anteriores entre culturas centrales y periféricas, entre lenguas y creencias. La beligerancia intercultural no se limita a la que mantenían entre sí los enfrentados partidos de los blancos, o los gobiernos criollos y los indios, sino que se extiende a una consideración universal: todas las civilizaciones llevan en sí sus propios “bárbaros”: los irlandeses lo han sido históricamente con respecto a la hegemonía británica, los gallegos con respecto a la de Castilla, en España, y esto no deja de debatirse en las relaciones entre los personajes: los criollos, aborígenes, ingleses, irlandeses, gallegos, castellanos, que convergen en ese microcosmos de la frontera donde desaparecen las “identidades puras” y donde, en definitiva, sólo logran sobrevivir los que aceptan traducir y ser traducidos a la lengua de los otros, los que llegan a una concepción plural, abierta, no dicotómica, de la identidad, y sin renunciar a lo propio pueden aceptar la devolución de sí mismos que les ofrece la mirada ajena, y aprender del que consideran su enemigo. La experiencia de haber sobrepasado todos los límites de lo conocido, de haber llegado al Fin de la Tierra — y éste es el simbolismo central de la novela — puede dejarnos paralizados frente al abismo, o puede llevarnos a saltar del otro lado, y encontrar la otra tierra que hay más allá de lo que se creía el fin [20]. Los dos fines de mundo: el pampeano y el europeo, se espejan entre sí, cada uno remite al otro, en un movimiento de vaivén que construye una compleja figura identitaria (re)nacida en el tránsito y el intersticio [21].

Conclusiones

Resulta interesante comprobar cómo hacia fines del siglo XX y principios del XXI, la línea marginal abierta en el siglo XIX por las olvidadas escritoras y por Lucio V. Mansilla, reaparece en una novelística histórica más predispuesta a reconocer la contribución fundadora de las etnias no blancas a partir de la primera conquista, así como a exhibir la aplastante disparidad entre los ocupadores de los últimos territorios y sus víctimas [22].

La relativización de la dicotomía civilización/barbarie recorre la literatura argentina, donde la instaló — mucho más en un sentido estrictamente político que en el literario y antropológico — la voz poderosa de Sarmiento. Percibimos asimismo esta relativización en el único narrador no ya sólo latinoamericano sino de la lengua española, que el señor Harold Bloom ha tenido a bien incluir en su canon occidental: Jorge Luis Borges. En la concepción borgesiana, plasmada en cuentos como “El informe de Brodie” o “Historia del guerrero y de la cautiva”, llamar a otro “bárbaro”, o autoconsiderarse “civilizado” depende siempre del punto de vista y la coyuntura histórica. Y todas las culturas, aun las que juzgamos más altas, son capaces de procesos destructivos y autodestructivos, de disolución y negatividad, en el sentido sarmientino de “barbarie”, como se aprecia en “El Inmortal” y en “Utopía de un hombre que está cansado” (Lojo 1997).

Más allá de la mirada escéptica y melancólica que las reflexiones de Borges arrojan sobre la historia universal, la Argentina ha retornado sobre su propia y concreta historia para incluir en ella sujetos que antes no cabían en su relato (desde las mujeres hasta los aborígenes), y lo ha hecho no sólo desde la novela, sino desde una abundante producción historiográfica, académica y de divulgación. Ello no significa renegar de los componentes europeos que a menudo se valorizaron de manera exclusiva y excluyente, pero sí implica una ampliación de la mirada narrativa y autocomprensiva.

NOTAS Y REFERENCIAS

- [1] Una primera versión incompleta fue publicada como folletín en 1851 (Montevideo). Apareció como libro en Buenos Aires en 1855, con varias modificaciones respecto del folletín.
- [2] González Acosta considera que *Jicoténcal* (1826) es la primera novela histórica de Hispanoamérica y también la primera novela de intención indigenista.
- [3] El relato fue publicado póstumamente en este año por el crítico Juan María Gutiérrez, pero su escritura se estima datada entre 1837 y 1840.
- [4] “Además del desdén a la herencia española, los hombres del '37 mostraban un acuerdo casi universal respecto de la inadecuación de los grupos étnicos de la Argentina, sus ‘razas’ como eran llamadas” (SHUMWAY 2002, p. 157).
- [5] “Facundo, el más insigne de los *gauchos malos*, es la personificación evidente del ‘espíritu de la Pampa’ que para Sarmiento constituye la naturaleza profunda de lo argentino: ‘pues si solevantáis las solapas del frac con que el argentino se disfraza, hallaréis siempre el gaucho más o menos civilizado pero siempre el gaucho’” (Lojo 1994, p. 66). Desde luego, Facundo Quiroga no era, por su clase social, un gaucho (aunque sobresaliera en todas las destrezas de la vida gaucha) ni tampoco su figura histórica real corresponde al sesgado retrato proporcionado por Sarmiento.
- [6] “¿En qué se distingue la colonización española? En que la hizo un monopolio de su propia raza, que no salía de la edad media al trasladarse a América y que absorbió en su sangre una raza prehistórica servil. ¿Qué le queda a esta América para seguir los

- destinos prósperos y libres de la otra? Nivelarse, y ya lo hace, con las otras razas europeas, corrigiendo la sangre indígena, con las ideas modernas, acabando con la edad media" (SARMIENTO 1953, XXXVIII, p. 405); señala por su parte Ingenieros, celebrando la masiva inmigración europea a partir de la caída de Rosas: "De las razas indígenas (ajenas en todo tiempo a nuestra nacionalidad política y social) quedan restos exiguos: están localizados en esos mismos territorios que, por sus condiciones físicas, no son propicios a la adaptación de las razas europeas. Los negros se han extinguido; los mulatos de la zona templada son cada vez más blancos. En Buenos Aires, un negro argentino constituye un objeto de curiosidad" (INGENIEROS 1961, p. 262).
- [7] Cabe señalar que no por ello dejó Sarmiento de criticar a los inmigrantes remisos a integrarse al cuerpo de la nacionalidad tanto lingüística como cívicamente.
- [8] La publicó por primera vez en 1836 el erudito napolitano Pedro de Angelis en su memorable "Colección de Obras y Documentos relativos a la Historia Antigua y Moderna de las Provincias del Río de la Plata". Tomo las citas del texto de la edición de Gandía (Díaz de Guzmán, 1974).
- [9] Ver un detallado análisis de la trayectoria del episodio y las modificaciones que va sufriendo en su decurso en LOJO *et al.* (2007, pp. 25-73).
- [10] No sólo con respecto a los aborígenes, sino también en el caso de los africanos. Así ocurre en las obras de Juana Manuela Gorriti, y sobre todo de Juana Manso, y de Eduarda Mansilla, donde los negros llegan a asumir papeles protagónicos de gran dignidad humana.
- [11] TARNOPOLSKY (1996) ofrece un panorama general sobre las novelas de indios y primeros conquistadores, donde puede apreciarse, justamente, su escasez.
- [12] Seudónimo de Gustavo Martínez Zuviría.
- [13] No me refiero a ellas puesto que ya lo ha hecho el Dr. Robin Lefère (*cf.* texto siguiente).
- [14] Pueden señalarse también textos como *Señales del cielo* (1994) de María Angélica Scotti, o *Borrasca en las Clepsidras* (1980) de Laura del Castillo, que relacionan, ambas, los avatares generales de la Conquista con lo ocurrido en tierras del Plata, y trabajan sobre los conflictos del choque cultural y el mestizaje.
- [15] La novela tiene un epígrafe inicial proveniente de la famosa revista *Tía Vicenta*, del humorista Juan Carlos Colombres (Landrú). El epígrafe se titula: "Receta de Tía Vicenta para fabricar un argentino típico", y vale la pena citarlo: "Mezclar una mujer india de caderas anchas/ con dos caballeros españoles/tres gauchos muy mestizos./un viajero inglés/medio ovejero vasco/ y una pizca de esclavo negro./Dejar a fuego lento durante tres siglos./ Antes de servir/agregar de golpe cinco campesinos italianos del sud/un judfo polaco, o alemán, o ruso/ un tendero gallego/tres cuartos de mercachifle libanés/ y una puta francesa entera./ Dejar reposar cincuenta años./ Servir, amoldado y engominado" (2005, p. 11).
- [16] Muy difícil sería hoy publicar títulos como *Ejército poblador y civilizador. Lucha de fronteras en la guerra contra el indio*, de Eduardo E. Ramayón (1a ed. 1921), reeditado por EUDEBA en plena dictadura militar (1978).
- [17] *Callvucurá y la dinastía de los Piedra* (1884), *Painé y la dinastía de los Zorros* (1886), *Relmu, reina de los pinares* (1888). También a fines del siglo XIX se da el caso de Manuel Olascoaga (quien denuncia la alianza de los indios invasores con socios blancos que vendían el ganado robado en los malones) (TARNOPOLSKY 1996, pp. 75-90).

- [18] Fue reimpressa en 2006, también por la editorial Sudamericana, y traducida al gallego como *A fin da terra* (Vigo, Editorial Galaxia, 2006).
- [19] *Una mujer de fin de siglo* (1999) y *Las libres del Sur* (2004), si bien están incluidas en el ciclo tangencialmente, se distancian un tanto, por sus escenarios, y porque tematizan, en especial, la relación histórica de las mujeres con la escritura y la creación, en un espacio público que se les retacea.
- [20] Señala Gloria Videla de Rivero sobre *Finisterre*: “Cuando cada uno de nosotros cree haber llegado al fin de lo transitado, al fin del mundo, cuando sólo contemplamos un mar desconocido y embravecido, como el que inolvidablemente se contempla en ese peñón de Galicia, si somos capaces de hacernos cargo del abismo — sólo en ese caso — descubrimos que el mundo no se acaba ahí. Este es uno de los mensajes de esta rica novela. El otro, es la superación de los opuestos: la realidad humana e histórica es compleja y ambivalente. Los polos se matizan e interactúan. El ‘otro’ puede ser la contracara o el complemento de uno mismo. Los contrarios se atraen, se seducen. Nuestra identidad personal y colectiva se va fraguando entre contradicciones” (2007, p. 250).
- [21] Otras imágenes del extremo aparecen en dos novelas dedicadas al exterminio de los pueblos de la Tierra del Fuego: *Fuegia* (1991) de Eduardo Belgrano Rawson, y *La tierra del fuego* (1998) de Sylvia Iparraguirre. En ambas se pierde la noción de frontera e intercambio, sobrepasada por la tragedia de la destrucción absoluta.
- [22] “Jemmy Button contra el Imperio Británico” se dice, sarcásticamente en *La tierra del fuego*, para describir la situación de Button cuando es llevado a juicio por el asesinato de misioneros y tripulantes ingleses, cometido, en verdad como un acto de autodefensa para evitar los trabajos forzados en las misiones.

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Los procesos literarios de construcción y desconstrucción de la Historia*

por

Robin LEFERE**

KEYWORDS. — Historical Novel; Hermeneutics; Epistemology

SUMMARY. — *Literary Processes of Construction and Deconstruction of History.* —

Although it has not traditionally been held in high esteem, the historical novel is a particularly demanding genre in both aesthetic and intellectual terms. Indeed, since the 19th century and all along its many and rich transformations, this genre has played a significant role in the construction — and, more recently, the deconstruction — of national identities, both in Europe and in Latin America. In this context, which implies competition with the discourse of academic historians, it is crucial to highlight the way in which various historical themes have been treated in literature, and to explore their potential in hermeneutic terms as well as with respect to their political and philosophical goals.

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Existe un consenso acerca de que la novela histórica surge en la literatura de Occidente con Walter Scott. *Waverley* (1814) y más aún *Ivanhoe* (1819), por su mismo éxito e impacto en toda la literatura europea, fundan un género que iba a resultar especialmente fecundo: pensemos en Honoré de Balzac (*Les Chouans*), Victor Hugo (*Notre-Dame de Paris*), Alessandro Manzoni (*I promessi sposi*), nuestro Charles De Coster (*Thyl Ulenspiegel*) y, en el siglo XX ya, Ramón del

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** Prof. *Philologie romane*, Univ. Libre de Bruxelles, av. F. D. Roosevelt 50, 1050 Bruselas (Bélgica).

Valle-Inclán (*El ruedo ibérico*), Robert Graves (*I, Claudius*), Marguerite Yourcenar (*Mémoires d'Hadrien*) o, del otro lado del Atlántico, Alejo Carpentier (entre otras obras maestras, *El Siglo de las Luces*) y, en su estela, una caudalosa corriente de la literatura hispanoamericana contemporánea. Esto es: un género infinitamente más rico de lo que dejarían sospechar las publicitadas variaciones acerca de amores en tiempos de faraones.

Además, aquellas novelas escotianas fueron consideradas retrospectivamente como prototipos de la "novela histórica propiamente dicha", porque en ellas se encuentra una preocupación profunda por la Historia, más especialmente por la representación fidedigna del pasado nacional. Se trataba entonces de una originalidad que, junto al buen oficio del novelista, determinó el éxito de la fórmula en el contexto de una Europa que, en el plano literario, cultivaba cierta nostalgia romántica hacia el Pasado y que, en el plano político, trabajaba activamente en la creación de las identidades nacionales; no hay que olvidar que por esas mismas fechas se instauran en distintas universidades europeas las primeras cátedras de Historia. Consta, pues, que la novela histórica decimonónica desempeñó una importante función social y política, y esto seguiría siendo una de las características del género, especialmente en América Latina.

Ahora bien, si aceptamos la premisa — discutible — de que el criterio que define la "novela histórica propiamente dicha" es la preocupación por la representación fidedigna del pasado, cabe la pregunta: ¿qué significa exactamente, en el caso de la novela histórica, la representación fidedigna del pasado? Las respuestas son muy variables, y altamente polémicas. De hecho, el tipo de representación fidedigna de Scott, que se puede calificar globalmente como realista pero que también otorgaba el protagonismo a personajes inventados de la pequeña nobleza, fue puesto en entredicho ya por Alfred de Vigny en 1826, de manera explícita en el Prólogo a *Cinq-Mars ou une conjuration sous Louis XIII*, titulado *Réflexions sur la vérité dans l'art*. En este breve pero sugerente ensayo, Vigny reivindicaba:

- De manera reaccionaria (en el doble sentido literal e ideológico), el protagonismo de las grandes figuras políticas, que serían las que de verdad hacen la Historia (se revelaban ya las implicaciones políticas del género).
- Una novela histórica "visionaria", esgrimiéndose la distinción entre *le vrai* y *la vérité*. Vigny opone a la pobreza de los hechos ("lo verdadero") la riqueza e incluso la "verdad" de la plasmación artística, que sitúa los hechos dentro de la perspectiva del Sentido y de la Eternidad, revelando su valor moral y escatológico; esto es: se reivindica para la novela histórica una triple función ética, gnoseológica y religiosa.

Otras perspectivas encontramos en Hugo, en Flaubert, en Manzoni, en Tolstói, en Galdós o en Unamuno, por citar unos pocos de los grandes nombres que cultivaron el género en el mismo siglo XIX y se multiplican aún cuando consideramos la producción posterior. Es decir, la historia de la novela histórica es la his-

toria de una sucesión de fórmulas más o menos polémicas entre sí, que se corresponden con distintas concepciones de la Historia y de lo que debe ser la tarea del novelista con respecto a la representación de la Historia. Investigar dicha sucesión y dicha diversidad es desde luego uno de nuestros objetivos.

La historia de la novela histórica es también la historia de cómo los novelistas se relacionaron con la historiografía. De manera general, se trata de una relación ambigua, que oscila entre un respeto escolar y una soberbia condescendencia, y que se explica por una relación objetiva de competición entre dos tipos de discursos sobre el Pasado, cada uno con sus propios respaldos: la Institución académica y la ciencia para el Historiador, y para el novelista los prestigios del verbo, de la musa y tal vez de la filosofía (en la memoria de cada escritor late un pasaje famoso de la poética de Aristóteles, que reza que la poesía es más filosófica que la historia porque la primera habla de lo general mientras que la segunda de lo particular).

Una obra que representa un hito en la afirmación polémica de la novela histórica con respecto a la historiografía es *El Reino de este Mundo*, del gran Alejandro Carpentier. Este libro se centra en las rebeliones de esclavos negros que desembocaron en la independencia de Haití en 1804, y luego en el reinado de Henri Christophe. Destacan dos opciones muy notables (en 1949, fecha de la edición original):

- Se rescata y se tiende a adoptar la perspectiva de los negros; lo cual resultaba totalmente heterodoxo;
- Se cuentan las cosas de una manera que respeta y potencia lo “real maravilloso” que, según Carpentier, caracteriza a América Latina y la hace incomprendible para un discurso estrechamente racionalista.

Cabe subrayar que las críticas a la historiografía por parte de los novelistas iban a ser refrendadas por la misma ciencia, en un contexto en que se desarrolló, en particular desde toda una corriente de historiadores epistemólogos, la crítica de las pretensiones de la historiografía de decir la Verdad, el cuestionamiento sistemático de sus métodos y de sus prejuicios... y más aún: el reconocimiento de la naturaleza discursiva e incluso necesariamente narrativa e imaginativa de la disciplina histórica. Citemos dos frases de un ensayo representativo de esta tendencia, clásico ya:

Comme le roman, l'histoire trie, simplifie, organise, fait tenir un siècle en une page [...] (P. Veyne, *Comment on écrit l'histoire. Essai d'épistémologie*, 1971, p. 14)

L'histoire [...] demeure fondamentalement un récit et ce qu'on nomme explication n'est guère que la manière qu'a le récit de s'organiser en une intrigue compréhensible. (*ibid.*, p. 111)

Esa potente relativización de la verdad de la historiografía, que se ha difundido e impuesto en la segunda mitad del siglo XX, ha favorecido el género de la novela histórica, en especial de la que se toma muchas libertades con respecto a la historiografía.

Desde este punto de vista, se pueden distinguir al menos tres tipos básicos de invención novelesca (que no son mutuamente excluyentes):

- El autor puede proponer una novela histórica que sea complementaria con respecto a la historiografía. La invención viene a colmar las lagunas contingentes (falta de documentos) o necesarias (percepciones subjetivas, vidas interiores) de la historiografía, y el novelista acomete una tarea de exploración-especulación acerca de las circunstancias, motivaciones, vivencias... Un caso paradigmático es *El general en su laberinto* de Gabriel García Márquez (1989), dedicado a la figura de Simón Bolívar y en particular a sus últimos meses, tan trágicos como poco documentados.
- El autor puede proponer una «novelación» moderada de la Historia: manipular los datos históricos de forma que consiga un relato más vivo e impactante (historia dramatizada o hecho pintoresco, reducción dramatizante a — pongamos — cinco personajes donde había cincuenta, encuentros anacrónicos de figuras significativas...). Fue lo que hizo Arturo Uslar Pietri en *El camino de El Dorado* (1947), que narra, a partir de las crónicas, la expedición de Pedro de Ursúa por el río Amazonas (1559), en busca del reino mítico del Dorado, y la traición del famoso Lope de Aguirre.
- El autor puede proponer una interpretación de una época, un acontecimiento, una figura; menos una prudente interpretación historiográfica que una «visión» guiada por una intuición y una imaginación heurísticas, o por una intención simbólica. Ilustraría esta tendencia el *Lope de Aguirre, Príncipe de la libertad* de Miguel Otero Silva (1979), donde el protagonista es reivindicado como precursor de Bolívar.

¿Hace falta subrayar que lo inventado o imaginado dentro de esas tres perspectivas puede resultar riguroso y “fidedigno” o por lo menos sugerente, y como tal útil para el mismo historiador (valor heurístico)?

Esas tres perspectivas ofrecen también elementos de respuesta a una pregunta esencial: ¿cuáles son los poderes específicos de la novela histórica con respecto a la escritura de la Historia y a la historiografía (en especial desde el punto de vista gnoseológico)? Una pregunta tan compleja como abarcadora, pero que dista mucho de agotar el tema. Por ejemplo, convendría elaborar una tipología sistemática de las novelas históricas, y en correspondencia con ésta desarrollar una respuesta a otra pregunta fundamental: ¿cuáles son las diversas funciones políticas, sociales, culturales, estéticas que viene desempeñando la tematización de la Historia?

Desde luego, queda mucho en el tintero, pero lo dicho hasta ahora debe bastar para que quede fuera de duda la gran riqueza del género de la novela histórica (incluso para las ciencias políticas y morales), y para que se vislumbre el fecundísimo campo que ofrece para la investigación... un campo en que coincidimos María Rosa Lojo y un servidor, y cuya exploración sin duda puede beneficiarse de nuestras “miradas cruzadas”.

PROCES-VERBAUX — NOTULEN

Séance plénière du 18 octobre 2007

La séance plénière de rentrée de l'Académie Royale des Sciences d'Outre-Mer s'est tenue au Palais des Académies à Bruxelles. Elle est présidée par M. Christian Sturtewagen, Président de l'Académie et Directeur de la Classe des Sciences morales et politiques, entouré de M. Eric Van Ranst, Directeur de la Classe des Sciences naturelles et médicales, M. Christian De Meyer, Directeur de la Classe des Sciences techniques, et Mme Danielle Swinne, Secrétaire perpétuelle.

M. C. Sturtewagen ouvre la séance (pp. 421-422).

Il présente un exposé intitulé «Egyptosofie: ideologie of wetenschap?» (pp. 423-430).

M. E. Van Ranst donne une communication intitulée «Soil Salinization and Dental Fluorosis as a Result of Water Use in Zambia» (pp. 431-446).

M. C. De Meyer fait une lecture intitulée «Crisis Response or Disaster Relief Management» (pp. 447-466).

Ensuite, la Secrétaire perpétuelle présente le rapport sur les activités de l'Académie 2006-2007 (pp. 467-472).

La séance se clôture par la remise des diplômes aux lauréats du Concours 2007 et du Prix pour les Etudes portuaires Directeur général Fernand Suykens.

Plenaire zitting van 18 oktober 2007

De plenaire zitting van de Koninklijke Academie voor Overzeese Wetenschappen vond plaats in het Paleis der Academiën te Brussel. Zij werd voorgezeten door de Heer Christian Sturtewagen, Voorzitter van de Academie en Directeur van de Klasse voor Morele en Politieke Wetenschappen, omringd door de Heer Eric Van Ranst, Directeur van de Klasse voor Natuur- en Geneeskundige Wetenschappen, de Heer Christian De Meyer, Directeur van de Klasse voor Technische Wetenschappen, en Mevr. Danielle Swinne, Vast Secretaris.

De Heer C. Sturtewagen leidt de zitting in (pp. 421-422).

Hij geeft een uiteenzetting met als titel „Egyptosofie: ideologie of wetenschap” (pp. 423-430).

De Heer E. Van Ranst houdt een voordracht met als titel „Soil Salinization and Dental Fluorosis as a Result of Water Use in Zambia” (pp. 431-446).

De Heer C. De Meyer stelt een mededeling voor met als titel „Crisis Response or Disaster Relief Management” (pp. 447-466).

Vervolgens geeft de Vast Secretaris lezing van het verslag over de werkzaamheden van de Academie 2006-2007 (pp. 467-472).

De zitting wordt besloten met de overhandiging van de diploma's aan de laureaten van de Wedstrijd 2007 en de Prijs voor Havenstudies Directeur-generaal Fernand Suykens.

Liste de présence des membres de l'Académie

Classe des Sciences morales et politiques: H. Baetens Beardsmore, P. Bouvier, E. Bruyninx, F. de Hen, J. Jacobs, J. Klener, F. Nahavandi, F. Neyt, P. Petit, S. Plasschaert, P. Raymaekers, C. Sturtewagen, F. Van Noten, J.-L. Vellut, Y. Verhasselt, U. Vermeulen, H. Vinck.

Classe des Sciences naturelles et médicales: J. Alexandre, I. Beghin, J. Boly, J.-C. Braekman, E. Coppejans, M. De Dapper, J. Delhal, M. Deliens, R. Dudal, S. Geerts, D. Le Ray, J.-P. Malingreau, J.-C. Micha, H. Nicolai, R. Orban, J. Rammeloo, E. Roche, D. Swinne, J.-J. Symoens, C. Sys, P. Van der Veken, E. Van Ranst, M. Wéry.

Classe des Sciences techniques: A. Bernard, J.-M. Charlet, M. De Boodt, J. De Cuyper, C. De Meyer, G. Demarée, J.-J. Droesbeke, J. Hus, R. Leenaerts, W. Loy, A. Monjoie, P. Muchez, H. Paelinck, R. Paepe, F. Thirion, P. Van Damme, M. Van Den Herrewegen.

Aanwezigheidslijst van de leden van de Academie

Klasse voor Morele en Politieke Wetenschappen: H. Baetens Beardsmore, P. Bouvier, E. Bruyninx, F. de Hen, J. Jacobs, J. Klener, F. Nahavandi, F. Neyt, P. Petit, S. Plasschaert, P. Raymaekers, C. Sturtewagen, F. Van Noten, J.-L. Vellut, Y. Verhasselt, U. Vermeulen, H. Vinck.

Klasse voor Natuur- en Geneeskundige Wetenschappen: J. Alexandre, I. Beghin, J. Boly, J.-C. Braekman, E. Coppejans, M. De Dapper, J. Delhal, M. Deliens, R. Dudal, S. Geerts, D. Le Ray, J.-P. Malingreau, J.-C. Micha, H. Nicolăi, R. Orban, J. Rammeloo, E. Roche, D. Swinne, J.-J. Symoens, C. Sys, P. Van der Veken, E. Van Ranst, M. Wéry.

Klasse voor Technische Wetenschappen: A. Bernard, J.-M. Charlet, M. De Boodt, J. De Cuyper, C. De Meyer, G. Demarée, J.-J. Droesbeke, J. Hus, R. Leenaerts, W. Loy, A. Monjoie, P. Muchez, H. Paelinck, R. Paepe, F. Thirion, P. Van Damme, M. Van Den Herrewegen.

Classe des Sciences morales et politiques

Séance du 20 novembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. C. Sturtewagen, Directeur, assisté de M. P. Petit, Vice-Directeur, et de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: M. H. Baetens Beardsmore, Mmes P. Bouvier, E. Bruyninx, M. F. de Hen, Mme D. de Lame, MM. G. de Villers, J. Jacobs, J. Klener, Mme F. Nahavandi, M. J.-L. Vellut et Mme Y. Verhasselt, membres titulaires; MM. D. Huyge, S. Plasschaert, F. Van Noten et U. Vermeulen, membres associés; M. J.-M. Jadin, membre de la Classe des Sciences naturelles et médicales.

Invités: M. B. Dessein, Mme C. Kirschen, M. D. Van den Bulcke et Mme S. Van Hoeymissen.

Ont fait part de leur regret de ne pouvoir assister à la séance: MM. P. Collard, D. Demolin, Mme M. Engelborghs-Bertels, MM. J. Everaert, E. Haerinck, C. Ntampaka, P. Raymaekers, R. Rezsóhazy, J. Vanderlinden, G. Vanthemsche, H. Vinck, K. Vlassenroot et C. Willemen.

«China's economisch offensief in Afrika»

M. Sylvain Plasschaert présente une communication intitulée comme ci-dessus.

MM. Bart Dessein, Urbain Vermeulen et Pierre Petit prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

Le religieux, le laïque et le politique: les modèles occidentaux et asiatiques

M. Jacques Rifflet a présenté cette communication lors de la séance du 16 janvier 2007.

Après avoir entendu les rapports, la Classe décide de ne pas publier ce texte.

Désignation du rédacteur de l'éloge de M. André Huybrechts

La rédaction de l'éloge de M. André Huybrechts est confiée à M. Sylvain Plasschaert.

Klasse voor Morele en Politieke Wetenschappen

Zitting van 20 november 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer C. Sturtewagen, Directeur, bijgestaan door de Heer P. Petit, Vice-Directeur, en Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de Heer H. Baetens Beardsmore, Mevr. P. Bouvier, E. Bruyninx, de Heer F. de Hen, Mevr. D. de Lame, de HH. G. de Villers, J. Jacobs, J. Klener, Mevr. F. Nahavandi, de Heer J.-L. Vellut en Mevr. Y. Verhasselt, werkende leden; de HH. D. Huyge, S. Plasschaert, F. Van Noten en U. Vermeulen, geassocieerde leden; de Heer J.-M. Jadin, lid van de Klasse voor Natuur- en Geneeskundige Wetenschappen.

Uitgenodigd: de Heer B. Dessein, Mevr. C. Kirschen, de Heer D. Van den Bulcke en Mevr. S. Van Hoeymissen.

Betuiden hun spijt niet aan de zitting te kunnen deelnemen: de HH. P. Collard, D. Demolin, Mevr. M. Engelborghs-Bertels, de HH. J. Everaert, E. Haerinck, C. Ntampaka, P. Raymaekers, R. Rezsöházy, J. Vanderlinden, G. Vanthemsche, H. Vinck, K. Vlassenroot en C. Willemen.

China's economisch offensief in Afrika

De Heer Sylvain Plasschaert stelt een mededeling voor getiteld als hierboven. De HH. Bart Dessein, Urbain Vermeulen en Pierre Petit nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

„Le religieux, le laïque et le politique: les modèles occidentaux et asiatiques”

De Heer Jacques Rifflet heeft deze mededeling voorgesteld tijdens de zitting van 16 januari 2007.

Na de verslagen te hebben gehoord, beslist de Klasse deze tekst niet te publiceren.

Aanduiding van de opsteller van de lofrede van de Heer André Huybrechts

Het opstellen van de lofrede van de Heer André Huybrechts wordt aan de Heer Sylvain Plasschaert toevertrouwd.

Commission administrative: fin de mandat

Le mandat de M. Pierre Petit au sein de la Commission administrative échoit le 31 décembre 2007. M. Petit ne souhaitant pas le renouveler, la Commission propose à la Classe des Sciences morales et politiques de confier un mandat à M. Didier Demolin.

La Classe approuve cette proposition.

La séance est levée à 16 h 35.
Elle est suivie d'un Comité secret.

Bestuurscommissie: einde van mandaat

Het mandaat van de Heer Pierre Petit binnen de Bestuurscommissie vervalt op 31 december 2007. Gezien de Heer Petit het niet wenst te hernieuwen, stelt de Bestuurscommissie de Klasse voor Morele en Politieke Wetenschappen voor een mandaat toe te vertrouwen aan de Heer Didier Demolin.

De Klasse keurt dit voorstel goed.

De zitting wordt om 16 u. 35 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

Classe des Sciences morales et politiques

Séance du 11 décembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. C. Sturtewagen, Directeur, assisté de M. P. Petit, Vice-Directeur, et de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: MM. L. Baeck, H. Baetens Beardsmore, Mme P. Bouvier, MM. F. de Hen, J. Everaert, J. Jacobs, J. Klener, G. Vanthemsche, membres titulaires; M. F. Van Noten, membre associé; M. H. Vinck, membre correspondant.

Invités: Mme Sturtewagen et M. E. Thys.

Ont fait part de leur regret de ne pouvoir assister à la séance: Mme E. Bruyninx, M. P. Collard, Mme D. de Lame, M. D. Demolin, Mme M. Engelborghs-Bertels, MM. E. Haerinck, D. Huyge, F. Neyt, C. Ntampaka, P. Raymaekers, F. Reyntjens, R. Rezsóhazy, J. Vanderlinden, E. Vandewoude, J.-L. Vellut, Mme Y. Verhasselt et M. C. Willemen.

«De wereldwijde schok van China's reuzensprong»

M. Louis Baeck présente une communication intitulée comme ci-dessus.

MM. Honoré Vinck, Julien Klener et Francis Van Noten prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

Etudes de géographie linguistique berbère.

Variation géolinguistique et classification dialectométrique

Mme Mena Lafkioui a présenté cette communication lors de la séance du 21 novembre 2006.

Après avoir entendu les rapports, la Classe décide de désigner un troisième rapporteur dont les coordonnées seront fournies par M. Ferdinand de Hen.

Distinctions honorifiques

Par Arrêté royal du 3 octobre 2007, MM. R. Anciaux, F. de Hen et J. Everaert ont été nommés Grand Officier de l'Ordre de Léopold; M. M. Graulich, Grand Officier de l'Ordre de la Couronne; M. F. Reyntjens, Commandeur de l'Ordre de Léopold.

La séance est levée à 16 h 30.
Elle est suivie d'un Comité secret.

Klasse voor Morele en Politieke Wetenschappen

Zitting van 11 december 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer C. Sturtewagen, Directeur, bijgestaan door de heer P. Petit, Vice-Directeur, en Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de HH. L. Baeck, H. Baetens Beardsmore, Mevr. P. Bouvier, de HH. F. de Hen, J. Everaert, J. Jacobs, J. Klener, G. Vanthemsche, werkende leden; de Heer F. Van Noten, geassocieerd lid; de Heer H. Vinck, corresponderend lid.

Uitgenodigd: Mevr. Sturtewagen en de Heer E. Thys.

Betuïgden hun spijt niet aan de zitting te kunnen deelnemen: Mevr. E. Bruyninx, de Heer P. Collard, Mevr. D. de Lame, de Heer D. Demolin, Mevr. M. Engelborghs-Bertels, de HH. E. Haerinck, D. Huyge, F. Neyt, C. Ntampaka, P. Raymaekers, F. Reyntjens, R. Rezsóhazy, J. Vanderlinden, E. Vandewoude, J.-L. Vellut, Mevr. Y. Verhasselt en de Heer C. Willemen.

De wereldwijde schok van China's reuzensprong

De Heer Louis Baeck stelt een mededeling voor getiteld als hierboven.

De HH. Honoré Vinck, Julien Klener en Francis Van Noten nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

„Etudes de géographie linguistique berbère.

Variation géolinguistique et classification dialectométrique”

Mevr. Mena Lafkioui heeft deze mededeling voorgesteld tijdens de zitting van 21 november 2006.

Na de verslagen te hebben gehoord, beslist de Klasse een derde verslaggever aan te duiden, van wie de personalia door de Heer Ferdinand de Hen overgemaakt zullen worden.

Eervolle onderscheidingen

Bij Koninklijk Besluit van 3 oktober 2007 werden de HH. R. Anciaux, F. de Hen en J. Everaert tot Grootofficier in de Leopoldsorde, de Heer M. Graulich tot Grootofficier in de Kroonorde en de Heer F. Reyntjens tot Commandeur in de Leopoldsorde benoemd.

De zitting wordt om 16 u. 30 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

Classe des Sciences naturelles et médicales

Séance du 27 novembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. E. Van Ranst, Directeur, assisté de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: MM. J. Alexandre, I. Beghin, E. De Langhe, M. Deliens, M. Erpicum, P. Gigase, P. Goyens, J.-M. Jadin, F. Malaisse, H. Maraite, H. Nicolaï, A. Ozer, C. Sys et M. Wéry, membres titulaires; M. D. Le Ray, membre associé; Mme Y. Verhasselt, membre de la Classe des Sciences morales et politiques; M. P. Van Damme, membre de la Classe des Sciences techniques.

Ont fait part de leur regret de ne pouvoir assister à la séance: MM. J. Belot, M. Coosemans, E. Coppejans, V. De Brouwere, M. De Dapper, J.-P. Descy, R. Dudal, J.-P. Malingreau, J.-C. Micha, S. Pattyn, Mme F. Portaels, MM. J. Rammeloo, E. Robbrecht, G. Stoops, J.-J. Symoens, L. Tack, Mme M. Temmerman, MM. D. Thys van den Audenaerde et P. Van der Veken.

Décès de M. Frans De Meuter

M. Eric Van Ranst annonce le décès, survenu à Vilvorde le 29 octobre 2007, de M. Frans De Meuter, membre titulaire honoraire.

Il retrace brièvement la carrière du Confrère disparu.

La Classe observe une minute de silence à la mémoire du défunt.

M. Frans De Meuter n'a pas souhaité d'éloge.

«Menselijke *Esophagostomiasis*. Een miskende parasitaire aandoening»

M. Paul Gigase présente une communication intitulée comme ci-dessus.

MM. Patrick Van Damme, Henri Nicolaï, Dominique Le Ray, André Ozer et Henri Maraite prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

Séchoirs et greniers dans le Nord-Cameroun: typologie et conservation des denrées stockées

M. François Malaisse présente une communication intitulée comme ci-dessus.

MM. Ivan Beghin, Patrick Van Damme, Henri Maraite, André Ozer et Jean-Marie Jadin prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

Klasse voor Natuur- en Geneeskundige Wetenschappen

Zitting van 27 november 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer E. Van Ranst, Directeur, bijgestaan door Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de HH. J. Alexandre, I. Beghin, E. De Langhe, M. Deliens, M. Erpicum, P. Gigase, P. Goyens, J.-M. Jadin, F. Malaisse, H. Maraite, H. Nicolaï, A. Ozer, C. Sys en M. Wéry, werkende leden; de Heer D. Le Ray, geassocieerd lid; Mevr. Y. Verhasselt, lid van de Klasse voor Morele en Politieke Wetenschappen; de Heer P. Van Damme, lid van de Klasse voor Technische Wetenschappen.

Betuygden hun spijt niet aan de zitting te kunnen deelnemen: de HH. J. Belot, M. Coosemans, E. Coppejans, V. De Brouwere, M. De Dapper, J.-P. Descy, R. Dudal, J.-P. Malingreau, J.-C. Micha, S. Pattyn, Mevr. F. Portaels, de HH. J. Rammeloo, E. Robbrecht, G. Stoops, J.-J. Symoens, L. Tack, Mevr. M. Temmerman, de HH. D. Thys van den Audenaerde en P. Van der Veken.

Overlijden van de Heer Frans De Meuter

De Heer Eric Van Ranst kondigt het overlijden aan, op 29 oktober 2007 te Vilvoorde, van de Heer Frans De Meuter, erewerkend lid.

Hij geeft een bondig overzicht van de carrière van de overleden Confrater.

De Klasse neemt een minuut stilte waar ter nagedachtenis van de overledene.

De Heer Frans De Meuter heeft geen lofrede gewenst.

Menselijke *Æsophagostomiasis*. Een miskende parasitaire aandoening

De Heer Paul Gigase stelt een mededeling voor getiteld als hierboven.

De HH. Patrick Van Damme, Henri Nicolaï, Dominique Le Ray, André Ozer en Henri Maraite nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

„Séchoirs et greniers dans le Nord-Cameroun: typologie et conservation des denrées stockées”

De Heer François Malaisse stelt een mededeling voor getiteld als hierboven.

De HH. Ivan Beghin, Patrick Van Damme, Henri Maraite, André Ozer en Jean-Marie Jadin nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

**«Biodiversiteit en biogeografie van de sub-Antarctische regio
gebaseerd op niet-mariene diatomeeën»**

M. Bart Van de Vijver a présenté cette communication lors de la séance du 23 janvier 2007.

Après avoir entendu les rapports, la Classe décide de publier ce texte dans le *Bulletin des Séances*.

Commission administrative: fin de mandat

Le mandat de Mme Françoise Portaels au sein de la Commission administrative échoit le 31 décembre 2007. Mme Portaels ne souhaitant pas le renouveler, la Commission propose à la Classe des Sciences naturelles et médicales de confier un mandat à M. Michel Erpicum.

La Classe approuve cette proposition.

La séance est levée à 16 h 25.
Elle est suivie d'un Comité secret.

**Biodiversiteit en biogeografie van de sub-Antarctische regio
gebaseerd op niet-mariene diatomeeën**

De Heer Bart Van de Vijver heeft deze mededeling voorgesteld tijdens de zitting van 23 januari 2007.

Na de verslagen te hebben gehoord, beslist de Klasse deze tekst in de *Mededelingen der Zittingen* te publiceren.

Bestuurscommissie: einde van mandaat

Het mandaat van Mevr. Françoise Portaels binnen de Bestuurscommissie vervalt op 31 december 2007. Gezien Mevr. Portaels het niet wenst te hernieuwen, stelt de Bestuurscommissie de Klasse voor Natuur- en Geneeskundige Wetenschappen voor een mandaat aan de Heer Michel Erpicum toe te vertrouwen.

De Klasse keurt dit voorstel goed.

De zitting wordt om 16 u. 25 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

Classe des Sciences naturelles et médicales

Séance du 18 décembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. E. Van Ranst, Directeur, assisté de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: MM. J. Alexandre, I. Beghin, E. Coppejans, M. Deliens, J.-P. Descy, M. Erpicum, P. Goyens, J.-M. Jadin, H. Maraite, H. Nicolaï, A. Ozer, G. Stoops, J.-J. Symoens, C. Sys, P. Van der Veken et M. Wéry, membres titulaires; MM. S. Geerts, J.-P. Malingreau, Mme R. Orban et M. E. Roche, membres associés; M. J. De Cuyper, membre de la Classe des Sciences techniques.

Ont fait part de leur regret de ne pouvoir assister à la séance: MM. L. D'Haese, V. De Brouwere, M. De Dapper, R. Dudal, P. Gigase, D. Le Ray, J.-C. Micha, S. Pattyn, Mme F. Portaels, MM. R. Swennen, L. Tack, Mme M. Vincx; et Mme Y. Verhasselt, membre de la Classe des Sciences morales et politiques.

La santé, la nutrition, les modes de vie et les attentes des adolescents au Gabon: résultats d'une enquête nationale

Mme Netti Nzouzi présente une communication intitulée comme ci-dessus.

MM. André Ozer, Ivan Beghin, Mme Rosine Orban, MM. Philippe Goyens, Jean-Jacques Symoens et Jean-Marie Jadin prennent part à la discussion.

La Classe accepte d'envisager la publication d'un texte et désigne deux rapporteurs.

«Complementaire voeding voor jonge kinderen in Afrika: stand van zaken»

M. John Van Camp a présenté cette communication lors de la séance du 19 décembre 2006.

Après avoir entendu les rapports, la Classe décide de publier ce texte dans le *Bulletin des Séances*.

Klasse voor Natuur- en Geneeskundige Wetenschappen

Zitting van 18 december 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer E. Van Ranst, Directeur, bijgestaan door Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de HH. J. Alexandre, I. Beghin, E. Coppejans, M. Deliens, J.-P. Descy, M. Erpicum, P. Goyens, J.-M. Jadin, H. Maraite, H. Nicolai, A. Ozer, G. Stoops, J.-J. Symoens, C. Sys, P. Van der Veken en M. Wéry, werkende leden; de HH. S. Geerts, J.-P. Malingreau, Mevr. R. Orban en de Heer E. Roche, geassocieerde leden; de Heer J. De Cuyper, lid van de Klasse voor Technische Wetenschappen.

Betwisten hun spijt niet aan de zitting te kunnen deelnemen: de HH. L. D'Haese, V. De Brouwere, M. De Dapper, R. Dudal, P. Gigase, D. Le Ray, J.-C. Micha, S. Pattyn, Mevr. F. Portaels, de HH. R. Swennen, L. Tack, Mevr. M. Vincx; en Mevr. Y. Verhasselt, lid van de Klasse voor Morele en Politieke Wetenschappen.

„La santé, la nutrition, les modes de vie et les attentes des adolescents au Gabon: résultats d'une enquête nationale”

Mevr. Netti Nzouzi stelt een mededeling voor getiteld als hierboven.

De HH. André Ozer, Ivan Beghin, Mevr. Rosine Orban, de HH. Philippe Goyens, Jean-Jacques Symoens en Jean-Marie Jadin nemen aan de bespreking deel.

De Klasse stemt ermee in de publicatie van een tekst te overwegen en duidt twee verslaggevers aan.

Complementaire voeding voor jonge kinderen in Afrika: stand van zaken

De Heer John Van Camp heeft deze mededeling voorgesteld tijdens de zitting van 19 december 2006.

Na de verslagen te hebben gehoord, beslist de Klasse deze tekst in de *Mededelingen der Zittingen* te publiceren.

Distinction honorifique

Par Arrêté royal du 3 octobre 2007, M. Jean-Claude Micha a été nommé Grand Officier de l'Ordre de la Couronne.

La séance est levée à 16 h 15.
Elle est suivie d'un Comité secret.

Eervolle onderscheiding

Bij Koninklijk Besluit van 3 oktober 2007 werd de Heer Jean-Claude Micha tot Grootofficier in de Kroonorde benoemd.

De zitting wordt om 16 u. 15 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

Classe des Sciences techniques

Séance du 29 novembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. C. De Meyer, Directeur, assisté de M. L. Dejonghe, Vice-Directeur, et de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: MM. J. Berlamont, J.-M. Charlet, J. De Cuyper, P. De Meester, G. Demarée, P. Goossens, R. Leenaerts, W. Loy, A. Monjoie, J. J. Peters, J. Roos et F. Thirion, membres titulaires; MM. P. Ozer, E. Pirard, P. Sorgeloos, T. Van Frachen, M. Van Montagu et R. Winand, membres associés.

Ont fait part de leur regret de ne pouvoir assister à la séance: MM. L. André, A. Buldgen, T. Camelbeeck, J. Charlier, J. Debevere, H. Deelstra, J.-J. Dreesbeke, J. Feyen, A. François, J. Hus, A. Jaumotte, E. Lambin, A. Lejeune, L. Maertens, L. Martens, P. Muchez, J. Michot, H. Paelinck, J. Poesen, W. Van Impe; et Mme Y. Verhasselt, membre de la Classe des Sciences morales et politiques.

Les ressources minérales non métalliques de l'Altiplano bolivien. L'espoir d'un autre Eldorado

M. Eric Pirard présente une communication intitulée comme ci-dessus.

MM. Robert Leenaerts, Pierre Goossens, René Winand, Jean Jacques Peters et Jacques De Cuyper prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

«Aquacultuur: de blauwe biotechnologie van de toekomst?»

M. Patrick Sorgeloos présente une communication intitulée comme ci-dessus.

MM. Jef Roos, René Winand, Walter Loy, Jean Jacques Peters et Christian De Meyer prennent part à la discussion.

La Classe décide de publier ce texte dans le *Bulletin des Séances*.

La séance est levée à 16 h 30.
Elle est suivie d'un Comité secret.

Klasse voor Technische Wetenschappen

Zitting van 29 november 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer C. De Meyer, Directeur, bijgestaan door de Heer L. Dejonghe, Vice-Directeur, en Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de HH. J. Berlamont, J.-M. Charlet, J. De Cuyper, P. De Meester, G. Demarée, P. Goossens, R. Leenaerts, W. Loy, A. Monjoie, J. J. Peters, J. Roos en F. Thirion, werkende leden; de HH. P. Ozer, E. Pirard, P. Sorgeloos, T. Van Frachen, M. Van Montagu en R. Winand, geassocieerde leden.

Betuïgden hun spijt niet aan de zitting te kunnen deelnemen: de HH. L. André, A. Buldgen, T. Camelbeeck, J. Charlier, J. Debevere, H. Deelstra, J.-J. Droesbeke, J. Feyen, A. François, J. Hus, A. Jaumotte, E. Lambin, A. Lejeune, L. Maertens, L. Martens, P. Muchez, J. Michot, H. Paelinck, J. Poesen, W. Van Impe; en Mevr. Y. Verhasselt, lid van de Klasse voor Morele en Politieke Wetenschappen.

„Les ressources minérales non métalliques de l'Altiplano bolivien. L'espoir d'un autre Eldorado”

De Heer Eric Pirard stelt een mededeling voor getiteld als hierboven.

De HH. Robert Leenaerts, Pierre Goossens, René Winand, Jean Jacques Peters en Jacques De Cuyper nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

Aquacultuur: de blauwe biotechnologie van de toekomst?

De Heer Patrick Sorgeloos stelt een mededeling voor getiteld als hierboven.

De HH. Jef Roos, René Winand, Walter Loy, Jean Jacques Peters en Christian De Meyer nemen aan de bespreking deel.

De Klasse beslist deze tekst in de *Mededelingen der Zittingen* te publiceren.

De zitting wordt om 16 u. 30 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

Classe des Sciences techniques

Séance du 20 décembre 2007

(Extrait du procès-verbal)

La séance est ouverte à 14 h 30 par M. C. De Meyer, Directeur, assisté de Mme D. Swinne, Secrétaire perpétuelle.

Sont en outre présents: MM. J. Charlier, E. Cuyper, J. De Cuyper, P. De Meester, A. Jaumotte, R. Leenaerts, membres titulaires; MM. A. Buldgen, J. Hus, L. Martens, P. Muchez, T. Van Frachen et R. Winand, membres associés.

Ont fait part de leur regret de ne pouvoir assister à la séance: MM. L. André, H. Deelstra, L. Dejonghe, G. Demarée, J.-J. Droesbeke, P. Goossens, E. Lambin, A. Lejeune, W. Loy, J. Marchal, J. Michot, A. Monjoie, T. Notteboom, P. Ozer, H. Paelinck, J. J. Peters, J. Poesen, J. Roos, F. Thirion, P. Van Damme, W. Van Impe, M. Van Montagu; et Mme Y. Verhasselt, membre de la Classe des Sciences morales et politiques.

Eloge de M. Severin Amelinckx

M. Paul De Meester prononce l'éloge de M. Severin Amelinckx.

La Classe observe une minute de silence à la mémoire du Confrère disparu.

Le texte de cet éloge paraîtra dans le *Bulletin des Séances*.

Automatique des bioprocédés de traitement des eaux usées.

Coopération scientifique avec des partenaires marocains

M. Denis Dochain présente une communication intitulée comme ci-dessus.

MM. Robert Leenaerts, Philippe Muchez et Christian De Meyer prennent part à la discussion.

La Classe décide de ne pas publier ce texte.

Distinctions honorifiques

Par Arrêté royal du 3 octobre 2007, MM. P. De Meester, R. Leenaerts, W. Loy et R. Paepe ont été nommés Grand Officier de l'Ordre de Léopold; MM.

Klasse voor Technische Wetenschappen

Zitting van 20 december 2007

(Uittreksel van de notulen)

De zitting wordt om 14 u. 30 geopend door de Heer C. De Meyer, Directeur, bijgestaan door Mevr. D. Swinne, Vast Secretaris.

Zijn bovendien aanwezig: de HH. J. Charlier, E. Cuypers, J. De Cuyper, P. De Meester, A. Jaumotte, R. Leenaerts, werkende leden; de HH. A. Buldgen, J. Hus, L. Martens, P. Muchez, T. Van Frachen en R. Winand, geassocieerde leden.

Betuygden hun spijt niet aan de zitting te kunnen deelnemen: de HH. L. André, H. Deelstra, L. Dejonghe, G. Demarée, J.-J. Drosbeke, P. Goossens, E. Lambin, A. Lejeune, W. Loy, J. Marchal, J. Michot, A. Monjoie, T. Notteboom, P. Ozer, H. Paelinck, J. J. Peters, J. Poesen, J. Roos, F. Thirion, P. Van Damme, W. Van Impe, M. Van Montagu; en Mevr. Y. Verhasselt, lid van de Klasse voor Morele en Politieke Wetenschappen.

Lofrede van de Heer Severin Amelinckx

De Heer Paul De Meester spreekt de lofrede uit van de Heer Severin Amelinckx. De Klasse neemt een minuut stilte waar ter nagedachtenis van de overleden Confrater.

De tekst van deze lofrede zal in de *Mededelingen der Zittingen* gepubliceerd worden.

„Automatique des bioprocédés de traitement des eaux usées. Coopération scientifique avec des partenaires marocains”

De Heer Denis Dochain stelt een mededeling voor getiteld als hierboven.

De HH. Robert Leenaerts, Philippe Muchez en Christian De Meyer nemen aan de bespreking deel.

De Klasse beslist deze tekst niet te publiceren.

Eervolle Onderscheidingen

Bij Koninklijk Besluit van 3 oktober 2007 werden de HH. P. De Meester, R. Leenaerts, W. Loy en R. Paepe tot Grootofficier in de Leopoldsorde, de HH.

J. Berlamont, J. Debevere, L. Dejonghe et J. Roos, Grand Officier de l'Ordre de la Couronne; M. J. Charlier, Commandeur de l'Ordre de Léopold.

La séance est levée à 16 h 05.
Elle est suivie d'un Comité secret.

J. Berlamont, J. Debevere, L. Dejonghe en J. Roos tot Grootofficier in de Kroonorde en de Heer J. Charlier tot Commandeur in de Leopoldsorde benoemd.

De zitting wordt om 16 u. 05 geheven.
Zij wordt door een Besloten Vergadering gevolgd.

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