

# THE SCIENTIST IN THE CLASSROOM: THE MONTESSORI TEACHER AS SCIENTIST

by Ginni Sackett

*Ginni Sackett shares insights ignited by a presentation given by Professori Raniero Regni in Rome at an AMI International Trainers Meeting. Dr. Regni stated that, "To go beyond Montessori is to rediscover Montessori. Montessori is waiting for us in the future." By re-examining Montessori's writings, Sackett traces the subtle ways in which Montessori's scientific pedagogy has gradually become more associated with the teaching profession than with that of scientists, and she urges us to remember Maria's scientific foundations: "experiment...observation...evidence or proof." Because we study "children, not brains" in a prepared environment and because we offer experiences and do not impose experiences, we are uniquely poised to "help contemporary neuroscience" and contribute to future research.*

The Montessori adult supports the development of creativity and scientific innovation in children through the integrated approach known as Montessori education. But in order to implement this integrated approach, we must be, first and foremost, scientific practitioners who implement a method that Montessori described

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as being characterized by “experiment, observation, evidence, recognition of new phenomena, and reproduction and utilization of the new phenomena.” It is important that we continuously explore our work as scientists who use our creativity and our practical skills to generate knowledge and discover the truth about the children in our care.

On November 2, 2010, at an AMI international trainers meeting in Rome, I was fortunate to hear a marvelous presentation that was very relevant to that exploration. The title of the presentation was “The Power of Childhood and Montessori Geopedagogy” and it was presented by Professor Raniero Regni, an Italian scholar of Montessori pedagogy and a valuable Montessori ally. He ended a very intriguing presentation with this bold statement: “To go beyond Montessori is to rediscover Montessori. Montessori is waiting for us in the future.”

To illustrate how this quote can help us explore our role as scientific practitioners, I would like to tell you more of what Professor Regni said in that talk (as found in my personal notes):

Professor Regni spoke about recent discoveries in neuroscience—and stated that it is his belief that Maria Montessori would have liked these recent discoveries very much. It is also his belief that Montessori can help contemporary neuroscience because Montessori studied children, not brains; by studying children, *the whole child* as we say, Montessori avoided an error of modern science, which is to reduce a human spirit to a human mind/brain.

Montessori can also help neuroscience because she operated from a perspective of *offering* experiences to children rather than *imposing* experiences onto children—a very important distinction. Because of this focus, Montessori was able to absorb the best intentions of humanity and of science and stepped resolutely onto a path to defend the child from adult stereotypes... to deduce that education cannot individualize teaching—education can only individualize learning.... to see a chain of connection between the simplest gesture of a child and the destiny of the world ...and to never underestimate any child.

Professor Regni continued to state that we have no idea what a child can become—a child can grow to save the

world or grow to destroy the world. It is in this context that he concluded his talk with the quote featured above: “to go beyond Montessori is to rediscover Montessori. Montessori is waiting for us in the future.”

Let’s see if we can deduce what Professor Regni sees in our Montessori work that he would make such statements and come to such a conclusion. We can start by remembering that Maria Montessori was first and foremost a scientist. Far too often we forget this fact, and forgetting this fact is dangerous for ourselves, for our movement, and especially for the children we serve. Montessori achieved her method as a scientist, and when we forget that, we allow the world at large to forget it as well. More importantly, when we forget this origin in science, we allow ourselves to forget that we also—as practitioners of this method—must be first and foremost scientists in order to achieve success.

I think the world at large might be happy to not know Maria Montessori or her method as scientific. I propose that it is time we correct this misconception in the world by first correcting it in ourselves. How do we find ourselves in this situation, of glossing over the role that Montessori herself saw as the foundation for our work? Let’s take a brief look at Montessori history and see what we find.

Maria Montessori was our first scientist in the classroom. Our legacy as practitioners of Montessori education is not the legacy of an educator: It is the legacy of a scientist. Montessori came to this work as a scientist and she remained first and foremost a scientist until the end.

There is a story in our Montessori lore that is perhaps apocryphal or perhaps just ironic; a story of the child Maria, who is supposed to have announced her future career goal as “anything but a teacher!” And, as the story goes, she obeyed that self-generated mandate.

As we know—despite obstacles, oppositions, and barriers, Maria Montessori did avoid the more approved work of being a conventional teacher of her time and place. We know she became a scientist. She dabbled for a while in engineering and the hard sciences but

finally settled on medicine as her life's work. She became a physician. Contrary to popular belief, Maria Montessori was not the first woman doctor in Italy; she wasn't even the first woman admitted to the medical school of the University of Rome. No matter, being one of a few other brave pioneers does not diminish in any way her achievements.

But why is it easy for us to hear that anecdote—"anything but a teacher"—as ironic? Because as we all know, she *did* become a teacher, a teacher associated with a very specific method of teaching.

Or did she?

I propose that Maria Montessori remained a scientist throughout her life. She *never* became a teacher—except perhaps in the limited sense of sharing with *other adults* what she was learning in her work, and of helping *other adults* put what she was learning into practice.

But what she learned, she learned as a scientist by following the methods of a scientist. Maria Montessori was our first scientist



Maria Montessori observing children at work, Adyar, 1940

in the classroom. Our legacy as practitioners of Montessori education is not the legacy of an educator: It is the legacy of a scientist. Montessori came to this work as a scientist and she remained first and foremost a scientist until the end. She confirmed this identity as early as 1909, which was just two years after the astonishing discoveries and revelations of San Lorenzo. With the title of her first book, she describes the findings and discoveries—the revelations—from the first *Casa dei Bambini*. That title? In Italian: *Il Metodo della Pedagogia Scientifica applicato all'educazione infantile nelle Case dei Bambini*. In English: *The Method of Scientific Pedagogy as Applied to Child Education in the Children's Houses*.

Let's think about this title: It was carefully chosen, I'm sure. With this title, and the contents of the book it named, Maria Montessori placed herself squarely in the realm of the scientist. She took that place—claimed that place—without apology or apparent need for justification. And it seems that she never questioned her right to be in the realm of the scientist. But overtly or covertly, others for over a century *have* questioned her role and her place as a scientist. More tragically, many have not questioned but have simply ignored or dismissed or buried the science that drove Montessori's life and work.

It began almost immediately, in a subtle but crucial event, the publication of the English translation of this first book. Today we are still suffering the compounded effects of this subtle event: *The Method of Scientific Pedagogy as Applied to Child Education in the Children's Houses* became instead *The Montessori Method*.

For a species who lives so thoroughly in a symbolic world, this is not an idle shift in terminology. In that symbolic moment, the work of scientific pedagogy—*our* work and *our* legacy—was set on a course towards illegitimacy and obscurity as a method of education by being associated with the ideas and assumptions, one might even charge, the speculations of one particular human being.

We suffer the devastating effects of this dismissal in academic and legislative venues to this day. But Montessori herself was not deterred. In less than a decade, she was elaborating and systematizing this scientific method *as applied* to the education of children.

Her next major work is occasionally known in English by the title *Spontaneous Activity in Education*. I'll agree that this is not an easy title but one well worth pondering and understanding. Again in its more common *English* title, we see another subtle yet significant shift away from an objective science towards a method associated with the subjectified ideas of one individual; this book in English is more commonly titled *The Advanced Montessori Method Vol 1*.

Why did Montessori write these early texts? As any scientist would, Montessori wanted to share her findings; she wanted to share what she was learning with others. She shared what she was learning first in print—publishing her findings as we see starting a mere two years after the discoveries and revelations of San Lorenzo, and she continued to publish throughout her life. But she did not limit herself to publication for she was a tireless speaker who addressed a wide range of individuals over her lifetime on four continents through public lectures, academic convocations, idealistic conferences, and endless training courses. She was widely quoted in the press and she even utilized the new technology of radio to reach wider and more eclectic audiences. Over four plus decades, through all of this communication, she was first and foremost sharing the findings of her scientific work. Why? So that others could apply the same scientific approach in *their* work with children.

This is exemplified, I think, in the persistent use of the term *training* for Montessori teacher education. Why the word *training*? Montessori wanted to train others in a scientific method that can be applied to the education of children anywhere.

In the book, *Spontaneous Activity in Education* there is a chapter titled “My Contribution to Experimental Science” where Montessori writes in detail to describe and define this scientific method, this scientific pedagogy. She states definitively:

This new pedagogy belongs to the series of modern sciences, and not to antique speculations... it is not directly based on the purely metric studies of “positive psychology”.... the “method” which informs it...undoubtedly place(s) it among the experimental sciences. (73-74)

What can we conclude from this remarkable section of Montessori's remarkable book? She clearly places this new pedagogy as one among several modern sciences but makes a clear distinction between it and those "purely metric studies of positive psychology"—a distinction we still require to make a hundred years later and which Montessori makes as an important, unapologetic clarification. She distinguishes that this pedagogy is not just a theoretical proposition—it is a "method" (and I love that Montessori herself puts that word in quotation marks) and reinforces her conclusion that this method is not based on one person's speculation, one person's ideas of what *could* be a standard of education or *should* be a standard of education, but instead is based on the same scientific method that characterizes other experimental sciences.

Our pedagogy is a scientific pedagogy. It is grounded in a scientific method. It values truth over belief; and it values ideas over ideology. We don't have to fear new knowledge or new discoveries because we have a method that allows us to evaluate new discoveries in the light of the evidence we see around us every day in our work.

Embedded within this quote, we also find that Montessori lists the essential components of this "method"—the components which "undoubtedly place it among the experimental sciences" and undoubtedly distinguish it from the subjective "speculations" of one mind.

The essential components that inform this "method" of scientific pedagogy are *experiment, observation, evidence or proof, recognition of new phenomena, and reproduction and utilization of new phenomena.*

In a single paragraph, we see that *this* is the method; *these* are the activities that inform scientific pedagogy, *these* are the activities that transform us into scientists in our classrooms, *these* are the activities that must inform our work every day as we practice Montessori's scientific pedagogy.

What, then, does this list tell us about our work? Every day in our schools and classrooms at every level, we are conducting

*experiments*, constant experiments with each child who crosses the threshold of the environment, and this explains why *observation* is so important. Remember that when she began, Montessori did not know what she was going to discover, and neither do we. We *must* observe in order to study and to discover each child. Observation is the only way to study and discover without interfering with the experiment.

Thinking back to Professor Regni's presentation, we must observe in order to absorb the best intentions of humanity and of science. We must observe in order to step resolutely on a path to defend the child from adult stereotypes. This begins with defending each child from *our own* stereotypes of who this child is; only observation of what *is* can defend the child from our own preconceived notions and prejudices about childhood and about each particular child. We must observe to deduce how we can individualize learning for each child or young person in our care. Through this observation, *we also* may see a chain of connection between the simplest gesture of each child and the destiny of the world and only through observation can we guarantee that each of us will never underestimate any child we meet.

When we study the child through observation, what are we looking for? As with all scientists, we are looking for evidence and proof that we can trust as being reliable evidence to enhance, extend, increase, and validate our knowledge of what we discover. As scientists who never underestimate any child, we know, we assume, that some of the evidence or proof revealed by the objects of our observation will confirm what others have identified and described. Equally, we know and trust that some evidence will increase our understanding of what others have discovered under the same conditions before us. But as practitioners of a scientific method, we also must know and always be alert to recognize that occasionally, predictably, inevitably, this evidence will include the unexpected. It could contain some new phenomenon, some new revelation, something that we have never seen before in our environments, and perhaps something that no one else has described before.

We must be ever ready to recognize what is revealed. This includes recognition of new phenomena that reliably reflect the truth



Courtesy of Northwoods Montessori, Atlanta, Georgia

of a particular child, the truth of our children. And then—because we are not just passive witnesses in our method, because we are also active practitioners of our method, we must be ready to incorporate what we have recognized as truth into our work of *offering experiences* through which we can *reproduce and utilize these new phenomena*.

In doing this, we have some strong and reassuring guidance from Montessori herself and it is guidance present throughout the Montessori literature. For example, in the pamphlet titled *The Two Natures of the Child* she tells us:

What the discoverer has the power to do is reproduce the conditions for the repetition of the phenomena he has seen. He does so because he understands what produces them. (4)

So let's look again, even more closely, at what is going on here with the essential components of scientific pedagogy. Let's think again about the first word *experiment*. Eduardo Cuevas is the first

person I heard use the phrase “recreating the experiment.” Every Montessori classroom recreates the original experiments of Maria Montessori and her numerous collaborators for each of the age groups. Of course, we do not have to start from scratch in these experiments, and this is perhaps the main fact that allows Regni to state so emphatically his belief that Montessori has so much help to offer contemporary neuroscience. Montessori and her collaborators, standing on the shoulders of many who came before them, set up the original experiments, experiments whose main purpose was the discovery of the true nature of the human child, the universal nature of the human child prior to the culture of any particular time and place. The desire for this discovery reflects the curiosity, the key question, which prompted the experiment in the first place. It was Montessori’s question, asked with such trepidation and her heart in her hands, as she asked the children in San Lorenzo, “Who are you?” (*The Secret of Childhood* 122). It is because of this question that scientific pedagogy stands apart from the metric studies of positive psychology. As Montessori writes in *Spontaneous Activity in Education*:

This is not a science that measures the personality. It is a science that transforms the personality. (73)

From the observed evidence (the new phenomena revealed in those original experiments), Montessori and her collaborators identified certain key conditions that now form the foundations of scientific pedagogy. This center is the *environment* within which we place the objects of the experiment, human children. It is these environmental conditions within which human children are offered the best opportunities to transform according to the holistic organization of their true natures.

This fact explains why the training of new practitioners of scientific pedagogy includes such precise and exact information. As with any experiment, if we wish to achieve the expected results, we must recreate the experimental conditions exactly. If we alter the conditions, we alter the experiment itself, we alter the possible outcomes, and we alter what is able to be observed. When we alter the conditions, we are creating a *different* experiment.

Montessori writes about this in *Spontaneous Activity in Education*. She describes the *positive* fact that her experiment has rendered concrete:

To ensure the psychical phenomena of growth [in other words, to ensure the expected positive, transformative outcomes of the conditions], we must prepare the “environment” in a definite manner, and from this environment we must offer the child the external means directly necessary for him. (71)

Our constant, our daily Montessori experiment, studies children, not brains. Our experiment reveals children in their holistic splendor: body, mind, and spirit. In the experimental conditions so carefully prepared in the environment, each child can reveal the entirety of her being in all its complexity, and in all its variety, within the universal human type. As Professor Regni indicated, we can help contemporary neuroscience because we have these proven conditions for studying the whole child. Our scientific pedagogy can also help neuroscience because it operates from a perspective of *offering* experiences to children rather than *imposing* experiences onto children. When we lose this distinction and resort to *imposing* experiences, we again alter the experiment, because now we are directly affecting the child’s activity. We see that it is no accident that Montessori named her second analysis of scientific pedagogy *Spontaneous Activity in Education*.

We are scientists experimenting in the pristine conditions of our scientific laboratories, which we (perhaps prudently) nickname *classrooms*. To effectively recreate the experiment in our own classrooms, we must fully understand this challenging concept of spontaneous activity. This activity is sourced *in* the child and is not activity in response to experiences we impose onto those children but activity in response to experiences we offer to those children.

As with any science, the practice of scientific pedagogy requires an exquisite and meticulous mindfulness in its practitioners. I would like to end with what I hope will be a positive contribution to our mindfulness as practitioners of scientific pedagogy and

will be a positive contribution to our mindfulness as scientists in the classroom.

We Montessorians are rather well known for being quite certain about our method of educational practice; perhaps even a little dictatorial about it. The history of the Montessori movement is littered with the debris of disputes about authenticity and with accusations and judgments about who is following the authentic method and with disputes about whether there is still any room for improving or changing the method. Sometimes—as a student in our course recently observed—the Montessori movement seems more like a religious movement, with its history of doctrinal disputes and schism. I would like to propose that we do not have the time, and our work is too important, to get lost in issues of doctrine and in schisms.

I would like us to consider a distinction that I found by Louis Menand who is quoted in Paul Hawken's book *Blessed Unrest*.

Ideologies justify and dictate.  
Ideas question and liberate.(16)

I invite us all, every day, to meditate on this distinction and these questions it suggests:

- Are we the *custodians of an ideology* that can only justify and dictate an educational practice that is frozen in another time and place?
- Or are we the *caretakers of proven ideas* that guide us to constantly question, to constantly observe, in order to recognize reliable evidence of both expected and unexpected phenomena as they occur in our scientific laboratories?

By constantly questioning and constantly observing without stereotypes or prejudgment, we continually liberate ourselves to reproduce and utilize the truth of what is revealed. It should not be our pride or our blind obedience to our training that dictates how Montessori education is implemented. If we insist on specific, exact conditions for the ongoing experiment of Montessori education,



Courtesy of Sunstone Montessori School, Portland, Oregon

we can only do so out of our scientific conviction. We must know that if the conditions of the experiment are changed, you change the discoveries that are possible and you change the outcomes that will be possible for the children we serve.

Scientific pedagogy is not an ideology. It is a science, a system of knowledge and ideas. The science behind Montessori practice consists of ideas that question and liberate, and we are the caretakers of these ideas. We will do best when we perceive our work in the spirit of the scientist waiting for the truth to reveal itself when the conditions are aligned with the intended experiment.

We live in a time of many discoveries in contemporary neuroscience, contemporary learning theory, and contemporary research into the human condition. We are grateful and excited and justifiably affirmed, when so many of these discoveries validate the original insights and discoveries uncovered through one hundred years of scientific pedagogy.

But in the spirit of our science, we must remain open to the possibility of new discoveries that go *beyond* Montessori's original experiments.

Some discoveries might cause us to question our legacy of information that holds the promise of liberating us from some misconception, some imperfection that might be embedded in that legacy.

Professor Regni thinks Maria Montessori would have liked recent discoveries in neuroscience. I think Maria Montessori also would have liked it if neuroscience could contribute something new to her discoveries. More importantly, within the daily experiment of Montessori education, lie conditions that might take us beyond those original experiments.

I think Maria Montessori was looking for new discoveries within the practice of scientific pedagogy that would take us beyond the legacy and into the future. In fact, there is a strong indication that from the beginning, Montessori looked for the science that would extend beyond her own discoveries. One such indication is hidden towards the end of that first book she wrote, *The Montessori Method*.

This book of methods compiled by one person alone, must be followed by many others. It is my hope that starting from the individual study of the child educated with our method, other educators will set forth the results of their experiments. These are the pedagogical books which await us in the future. (373)

How did we miss this message that was written by Montessori at the start of her radical work? I think perhaps we all had better get going and publish *our* research, *our* discoveries as any good scientist would.

Our pedagogy is a scientific pedagogy. It is grounded in a scientific method. It values truth over belief; and it values ideas over ideology. We don't have to fear new knowledge or new discoveries because we have a method that allows us to evaluate new discoveries in the light of the evidence we see around us every day in our work. And we have the greatest control of error any science could ask for. The children we observe, the children we study, the children who are in our care are our control of error. These children and their spontaneous activity are within the precise and definitive conditions of our experimental environments.

We understand that it is not enough to know *what* to do in those environments, we must also know *why* we do it. And equally, it is absolutely important for us to know *how* we do it. When we follow *the how* and we apply the method that informs scientific pedagogy, we will keep resolutely on the path of valid and reliable discovery.

This scientific method that is based in experiment, observation, evidence, recognition of new phenomena, and replication and utilization of new phenomena will keep us aligned with truth and teach us to value truth even if and when the truth asks us to reconsider something we previously held to be correct.

And this method of scientific pedagogy will assure that we fix our attention on the *whole* child, rather than compartmentalized bits of the child. It assures that we will *offer* experience and never *impose* experience onto that child. It assures that we will avoid the fallacy of individualized teaching and that we will nurture individualized learning. It assures that we will relentlessly defend each child against the restriction of any and all adult stereotypes about childhood. It assures that we will never underestimate any child in our care because our method allows us the privilege of knowing each child in his and her unique wholeness.

And like Montessori, using this scientific pedagogy, we will see a chain of connection from the simplest gesture of a child to the destiny of the world. The truth of this method we practice is *in* that method itself: Education is not what we do; education is the outcome of what we do.

We must never fear to go beyond Montessori. Contemporary science will continually offer the possibility of affirming, enlarging, and enhancing what we already know. And we can trust that if we are willing to go beyond Montessori we will continually rediscover the validity of the work she began for us. As Raniero Regni so eloquently said, “She is waiting for us in the future.”

We all eagerly await—we absolutely need—the discoveries of each and every scientist applying this pedagogy every day in his or her classroom. I continually wonder, and I am eager to learn, what each of *you* will discover to share with the rest of us.

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