Wouter& Michael's Solo Newsletter
Monday 27 Sep 2021

What's On

Fri 1 Oct – SEA Zoo Donation

This Friday, SEA will present the Jurug Solo Zoo with Rp20,000,000 towards their running costs.

The local government in their wisdom has again imposed a ban on all children under 12 years olds entering the zoo. This is their major market, and so they are having a very hard time getting enough revenue to feed the animals and pay wages.

Our Kitabisa campaign was first envisaged by former president Charlotte, and though modest in scope, received quite a few very small donations. Towards the end of the campaign, Solo business tycoon Mr Berry van den Berkmortel generously pledged to top the money to our target of 20 milllion.

The zoo will be providing a small lunch at 1pm, followed by the presentation with the press at 2pm. All welcome to attend, but if you'd like to join us at the lunch, please let us know before Thursday.

Sun 3 Oct - SEA Barbeque

To celebrate the first firing of the Monster House Barbeque, this Sunday we are having a barbeque. There will be hamburgers, hotdogs and kebabs, all for the very modest price of Rp50,000, as much as you can eat. And of course, how can you have a barbeque without beer? With soft drinks for those who like them.

The half finished barbeque

The venue is Michael's Monster House, Jl. SMP PGRI13, Plesungan, Karanganyar (actually it's only 50m from the boundary of Surakarta). Come right tot the very end of the street, though parking is best outside Charlotte's house. To find us easily, Google "Studio Plesungan", which is our next door neighbour Melati's House.

Starts at 1pm until whenever. Everybody welcome.

Sun 3 Oct Japanese MotoGp & Singapore F1 Grand Prix

Place to be – Manir's Family Kitchen

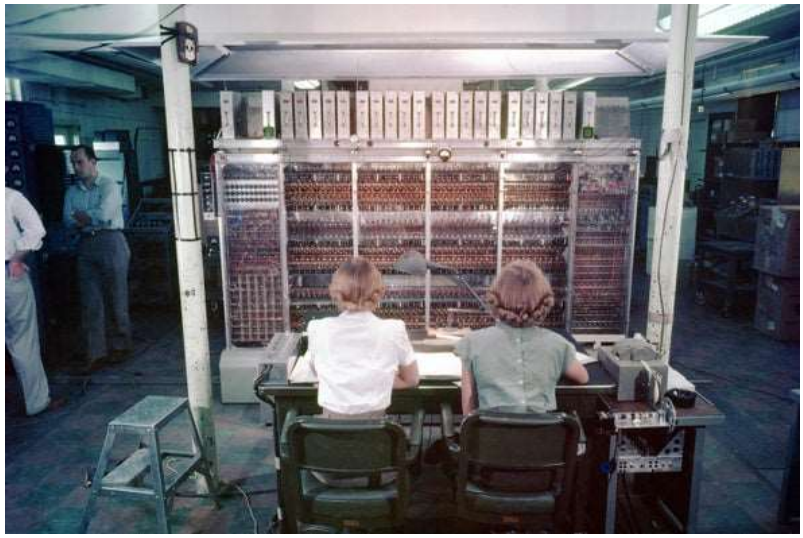
Coming Up

Fri 8 Oct	SEA Monthly Meeting
Sun 10 Oct	STUPID climb
Sun 10 Oct	Thailand MotoGp
Sun 10 Oct	Japanese F1 Grand Prix
Sun 24 Oct	STUPID climb
Sun 24 Oct	Australian MotoGp
Sun 24 Oct	American F1 Grand Prix
Sun 31 Oct	SEA Kereta Kelinci
Sun 31 Oct	Malaysian MotoGp
Sun 31 Oct	Mexican F1 Grand Prix

The News This Week

Giving Credit Where Due

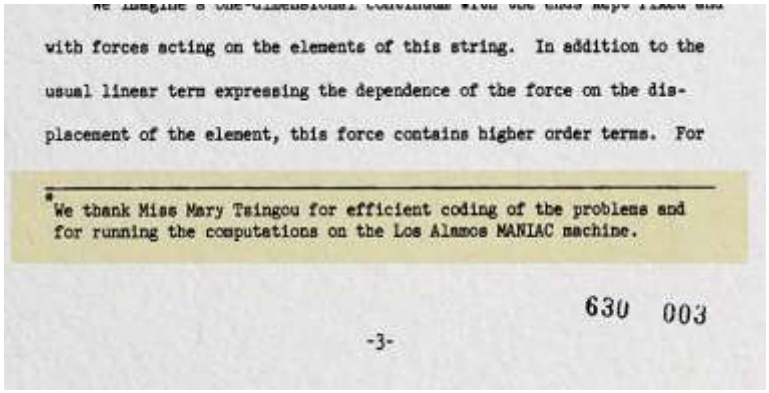
Half-century after just being mentioned as a footnote in a seminal physics paper, one of the first computer programmers at a top American institution, and a major contributor to the experiments, is finally getting the recognition she deserves.



Two unnamed women sit in front of the MANIAC computer in 1952

In 1955, Los Alamos Scientific Laboratory published the paper "Studies of Nonlinear Problems," which detailed the methods and results of a mathematical physics simulation run on the MANIAC, the Laboratory's first electronic computer. The scientists who wrote the paper - Enrico Fermi, John Pasta, and Stanislaw Ulam - were quickly recognized for the remarkable simulation, which came to be called the Fermi-Pasta-Ulam (FPU) problem. In a footnote, the authors wrote, "We thank Miss Mary Tsingou for efficient coding of the problems and for running the computations on the Los Alamos MANIAC machine."

It would be decades before that footnote would gain attention from the global scientific community, but Mary Tsingou Menzel (her name since getting married in 1958) was well-known among her colleagues throughout her 40-year career as a mathematician and computer programmer at Los Alamos. Today, she sees that early simulation as only a blip in a career that included the development of the first hydrogen bomb and work on the proposed missile-defence program known as Star Wars (the Strategic Defence Initiative). Though she retired almost 30 years ago, some of her coding work is used to this day, and her legacy remains in the monumental work she performed as one of the first computer programmers of the 20th century.



with forces acting on the elements of this string. In addition to the usual linear term expressing the dependence of the force on the displacement of the element, this force contains higher order terms. For

We thank Miss Mary Tsingou for efficient coding of the problems and for running the computations on the Los Alamos MANIAC machine.

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The postscript tro Mary on the 1955 scientific paper

In 1951, Mary Tsingou was an undergraduate studying mathematics and education at the University of Wisconsin when an instructor told her, "They're looking for women mathematicians at Los Alamos." The Korean War was on, and the Lab had found that hiring and training men as mathematicians was mostly futile because they were so often drafted. Faced with a job market that was particularly tough for female math teachers, Tsingou decided to apply. She landed the job, and on January 7, 1952, she moved to Los Alamos.

Upon being hired, Tsingou was flatly informed that she and the other young women would be paid less than men with the same skills and qualifications because "men were breadwinners and women were just supplementary." Still, Tsingou was excited about work at Los Alamos; she had chosen the job over others at companies such as General Electric because "the salary was twice as much" and because she had never been out West. She also felt pride in her position, working at a national security science laboratory during the Cold War. "We were doing this in the same way young men went into the military," she says of herself and her colleagues. "We knew it was something that was important for the country."

Tsingou's first job was in Theoretical (T) Division, and she worked in the T-1 group on calculations used in preparation for testing the design of the hydrogen bomb, which uses fusion (in addition to fission) to create an explosion even larger than the one an atomic bomb produces. Los Alamos was racing against the Soviets to

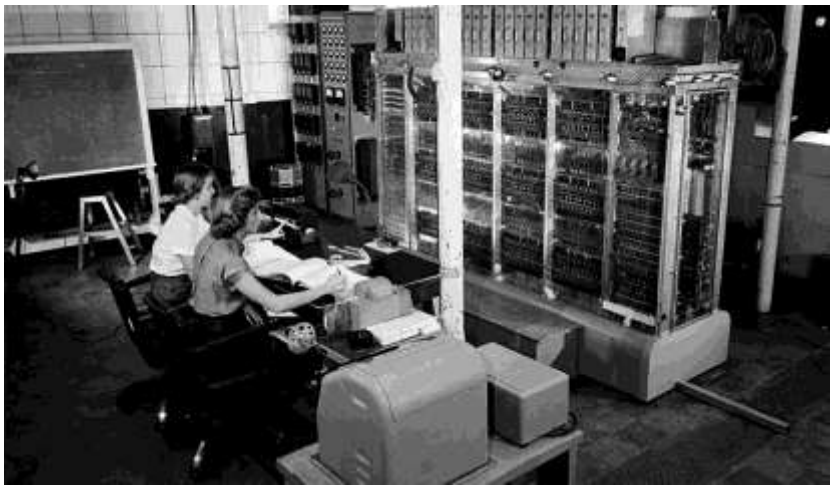
develop the hydrogen bomb, and the calculations performed in T-1 were of vital importance in determining if and how such a device could be detonated.

Mary Tsingou in 1955

Almost all the mathematicians who worked as human calculators at Los Alamos were women, most in their early 20s and just out of college. Using Marchant calculators - early machines that could add, subtract, multiply, and divide - they solved specific problems. Tsingou was surprised on her first day of work to discover that she wasn't using her math degree - she was just using a calculator to add and subtract. "I was sort of disappointed," she remembers. "When we get out of college, we say we're going to set the world on fire," but instead she was assigned what she calls "mundane types of jobs."

Tsingou was soon recruited to work as one of the first programmers, or coders, of the MANIAC (Mathematical Analyser, Numerical Integrator, and Computer). When the MANIAC was up and running, Tsingou says, the Lab didn't have anyone to program it, so Jack Jackson, a Los Alamos programmer who later ran the aerospace division at IBM, gave a class on programming. "I was very interested in learning programming," Tsingou says, "because it was pretty boring sitting there doing addition and subtraction."

Tsingou's job as a programmer was to tell the machine what calculations to perform, which required that she know binary (two-symbol) coding language. "It was a very rudimentary machine language," Tsingou says. "It was nothing like what we have now." The programming was extremely laborious. "You had to use what the machine recognized, which was only ones and zeros. We typed the directions on a tape and put it in the machine."



Operators work on the MANIAC in the 1950s

While learning to work on the MANIAC, Tsingou was given the task of programming the computer to compute the sine of an angle (in a right triangle, the length of an angle's opposite side divided by the length of the hypotenuse, which is the longest side). She checked and rechecked her work many times before running it through the machine. The first time she programmed her work into the MANIAC, her computation came out correct. She says, however, that this was the first and last time in her long career that she ever got a calculation to run correctly on the first try.

Tsingou soon moved to T-7, the MANIAC group, where she worked mostly with theoretical physicists Stanislaw Ulam and John Pasta. While much of their work was in weapons development, the physicists of T Division were also interested in fundamental science - that is, science that is developed purely for scientific advancement, often without a specific endgame. The MANIAC opened new avenues for such inquiry, and Pasta and Ulam were among those quick to explore them.

Once the MANIAC was operational, physicists began trying to think of problems that could not be solved with hand calculations but that could be simulated on the computer. Simulations, now widely used but then in their earliest stages, use math to create models of how systems will interact or develop; simulations can tell us what would happen if something created theoretically were to happen in real life.

“I remember sitting there one day with Pasta and Ulam,” Tsingou says, as they brainstormed “some problems we could do on the computer, some really mathematical problems.” They tried several things, but, eventually, she remembers, “they came up with this vibrating string.”

Scientists Enrico Fermi, Stanislaw Ulam, and John Pasta authored “Studies of Nonlinear Problems,” the paper on the vibrating string experiment, which was programmed by Mary Tsingou.

The vibrating string was a theoretical experiment involving “a finite number of points” along a string “with ends fixed and [energy] acting on the elements of the string,” according to the resulting paper. Under the assumption that the string could move in all directions - not just back and forth - Tsingou programmed the MANIAC to simulate how energy would move between points on the string.

The scientists thought that the energy would eventually reach equilibrium, spreading out in an equal distribution along the string and settling that way. The result of the simulation was completely unexpected. “Let us say here that the results of our computations show features which were, from the beginning, surprising to us,” the authors wrote. The energy moved periodically between different points on the string, never spreading out and never coming to rest.

The Fermi-Pasta-Ulam problem was a game changer for mathematics and science, and it was a seminal development in computational physics. The problem launched the field of nonlinear science and a number of other scientific concepts, including chaos theory, which posits that patterns exist even in seemingly random, complex systems.

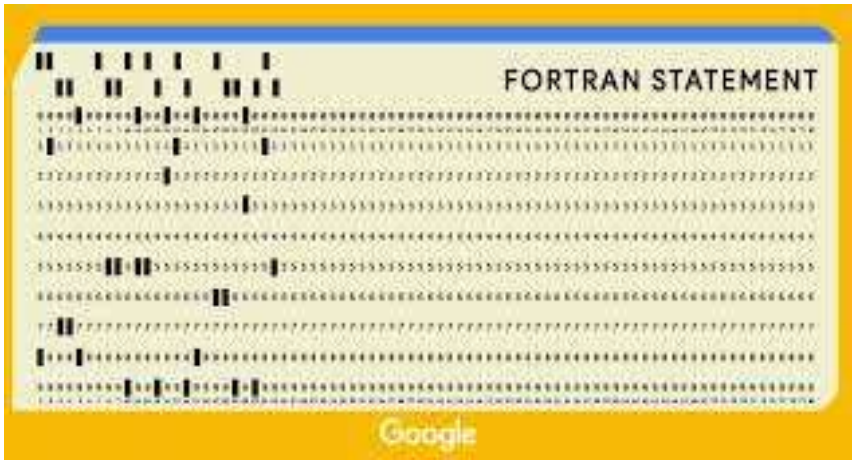
The experiment proved that there were ways to simulate problems that could not be studied with literal experiments or solved with traditional theoretical methods of numerical analysis. According to Cynthia Reichhardt, a scientist in the current T-1 group, Physics and Chemistry of Materials, that revelation “combined with improvements in computer technology, led to the flowering of simulations as a third research approach, complementary to both experiments and traditional analytic theory.”

And in a 2009 American Scientist article, scholars Mason Porter, Norman Zabusky, Bambi Hu, and David Campbell claimed that the problem “rocked the scientific world” and “sparked a revolution in modern science.”

Fermi, Pasta, and Ulam developed the theory; Tsingou made it work. “They didn’t know anything about programming,” she remembers. “They set up the equations, and I did all the programming.” Tsingou is quick to mention that she was given credit in the paper as a programmer. But today, many scientists think she deserves more. In 2008, French physicist Thierry Dauxois argued in a *Physics Today* article, “Fermi, Pasta, Ulam, and a Mysterious Lady,” that Tsingou had not been given the credit she was due. “It is time for a proper recognition of her contribution,” he wrote. “Let us refer from now on to the Fermi-Pasta-Ulam-Tsingou problem.” As a result, some scientists now refer to the simulation as the FPUT rather than the FPU.

Los Alamos National laboritory

By today’s standards in the scientific community, Mary Tsingou would have been an author on the paper - she might have even been the first author, the person who contributed the most to the project. Among those who agree with the renaming of the problem is David Campbell, Professor of Physics, Electrical and Computer Engineering, and Materials Science and Engineering at Boston University and former director of the Center for Nonlinear Studies at Los Alamos. “Certainly,” he says, “today she would have been listed as co-author, which is why the current practice is to refer to the FPUT problem.”



Early Fortran programs ran on pumched card imputs to the computer

The experiment set in motion the field of nonlinear science, currently studied worldwide, including at Los Alamos, where the Lab houses an entire Center for Nonlinear Studies. Nonlinear science, broadly defined, is the study of complex systems that are typically very difficult to solve because they can’t be broken down into smaller, simpler systems. The central ideas of the field, Campbell says, “have spread over essentially all scientific disciplines and also moved into the social sciences, altering the way we look at the world.”

Tsingou was asked to re-create and expand the simulation at times during her career. “I’m surprised that it got so much notice, even from the beginning,” Tsingou says. “Even when I was still working, people would call me up about it.” Researchers have picked up Tsingou’s work and continue it to this day, pushing the parameters further to see if the energy on the string will ever settle. So far, it has not. Despite the experiment’s profound influence on modern science, Tsingou remains very humble about her work on the problem. Its name, she says, “didn’t matter to me. I was just doing the job. I was glad to get paid.”

Though she initially agreed only to a six-month assignment on the MANIAC, Tsingou ended up working on the MANIAC until she temporarily left the Lab in 1954 to get her master’s degree in mathematics from the University of Michigan. After returning in 1955, she worked on various computers and projects, gaining particular notice for her expertise in an early programming language called Fortran.

“When Fortran came, it was almost like paradise,” she says. The new programming language was much less laborious than the language used for programming the MANIAC, and it was capable of commands that were impossible before, so programming the calculations was much easier and much faster.

As an early Fortran expert, Tsingou went on to many more career accomplishments, including editing and manipulating the Poisson Group codes. These codes were used on a number of Los Alamos projects, including a proton storage ring used to facilitate the acceleration of a beam of electrons so the beam could travel fast enough to, upon striking another material, cause the release of that material’s neutrons. Magnets were used to keep the beam going around the ring, so scientists needed precise calculations of the magnetic field.

The Poisson codes were also used for Tsingou’s work on programming a system for Star Wars that could pick out a nuclear weapon from a group of weapons, some nonnuclear. “The idea at the Laboratory,” Tsingou says, “was that the Soviets might send a nuclear warhead toward the United States that would be surrounded by missiles carrying nonnuclear warheads, leaving the United States unsure which one to take out in defence.” Tsingou worked with groups that “created simulations to detect which incoming objects were carrying nuclear weapons.”

People called from all over the country with questions for Tsingou about the Poisson Group codes. Frank Krawczyk, an Accelerators and Electrodynamics group scientist who currently manages the Poisson codes at Los Alamos, explains that the users of the codes are still widespread. “All U.S. national laboratories that use accelerators or electromagnetics in general are using the codes,” he says. Poisson is a teaching tool at universities and is included in the curriculum of the U.S. Particle Accelerator School. Tsingou’s team “helped develop software tools that changed the way scientists developed subsystems for accelerators,” Krawczyk says, and these same tools, “are still relevant in the 2020s.”

Before Tsingou retired in 1991, she was one of the main writers of the codes’ user manual. Although the manual has been revised over the years, sections of the current version are “mostly identical to the earlier versions,” according to Krawczyk.

Mary Tsingou lauds Los Alamos as a wonderful place to work, but she is also frank about the disparities in treatment of men and women throughout her career. “Unfortunately,” she says, “the men always got the more interesting problems, and the women were always relegated to the mundane - keeping the machine going and stuff like that.”

In 2019, Mary Tsingou Menzel and her husband, Joe Menzel, were photographed in their Los Alamos home during an interview for the American Institute of Physics

An anecdote told by Mary Kircher, another mathematician who started working at Los Alamos around the same time that Tsingou did, highlights the gender inequalities that were prevalent in the mid-20th century. “Back in the MANIAC days,” Kircher told an interviewer in 2002, “the first sign that it was really not going to be a woman’s job anymore was when Jack Jackson got some of the young men together - none of the women” for an important MANIAC project. “We were not invited.…And there was some bitterness about it, of course.…I know Mary [Tsingou] was upset.”

“We as women were expected to be second rate,” Tsingou says. She was repeatedly told by supervisors that they were trying to raise her salary to equal that of a man with her skills and experience; she never understood, she says, why they couldn’t just do it. Not long before she retired, Tsingou received a settlement from a gender

inequity lawsuit filed against the Laboratory by Janet Wing, a fellow computer programmer; Tsingou used the money to buy a video camera for her then-pregnant daughter.

Tsingou still lives in Los Alamos with her husband, Joseph Menzel, whom she met in Los Alamos when he worked in protective forces. They live in the home they were assigned based on the Laboratory's early point system, determined by salaries, how long they had worked at the Laboratory, and the size of their family. "At that time," Tsingou says, "when you were married, you were only eligible for apartments, and then when you were at least three months pregnant, you were eligible to apply for a house." The Menzels moved into their home when Tsingou was pregnant with their first daughter. Their two daughters now live in Texas and Pennsylvania, "but this is our place," Tsingou says. "This is our home."

Looking back on her career, Tsingou expresses fondness for the projects she worked on and marvels at the ways in which the world is different from what scientists of the mid-20th century thought it would be. "They thought nuclear energy was going to change the world," she says, "but it's the computers that have changed the world."

National Cows

A BRITISH CORPORATION

You have two cows.
Both are mad.

AN INDIAN CORPORATION

You have two cows.
You worship them.

AN IRAQI CORPORATION

Everyone thinks you have lots of cows.
You tell them that you have none.
Nobody believes you, so they bomb the crap out of you and invade your country.
You still have no cows but at least you are now a Democracy.

A GREEK CORPORATION

You have two cows borrowed from French and German banks.
You eat both of them.
The banks call to collect their milk, but you cannot deliver so you call the IMF.
The IMF loans you two cows.
You eat both of them.
The banks and the IMF call to collect their cows/milk.
You are out getting a haircut.

TRADITIONAL CAPITALISM

You have two cows.
You sell one and buy a bull.
Your herd multiplies, and the economy grows.
You sell them and retire on the income.

AN AMERICAN CORPORATION

You have two cows.
You sell one, and force the other to produce the milk of four cows.
Later, you hire a consultant to analyse why the cow has died.

A CHINESE CORPORATION

You have two cows.
You have 300 people milking them.
You claim that you have full employment and high bovine productivity.
You arrest the newsman who reported the real situation.

AN AUSTRALIAN CORPORATION

You have two cows.
Business seems pretty good.
You close the office and go for a few beers to celebrate.

A FRENCH CORPORATION

You have two cows.
You go on strike, organize a riot, and block the roads, because you want three cows.

AN IRISH CORPORATION

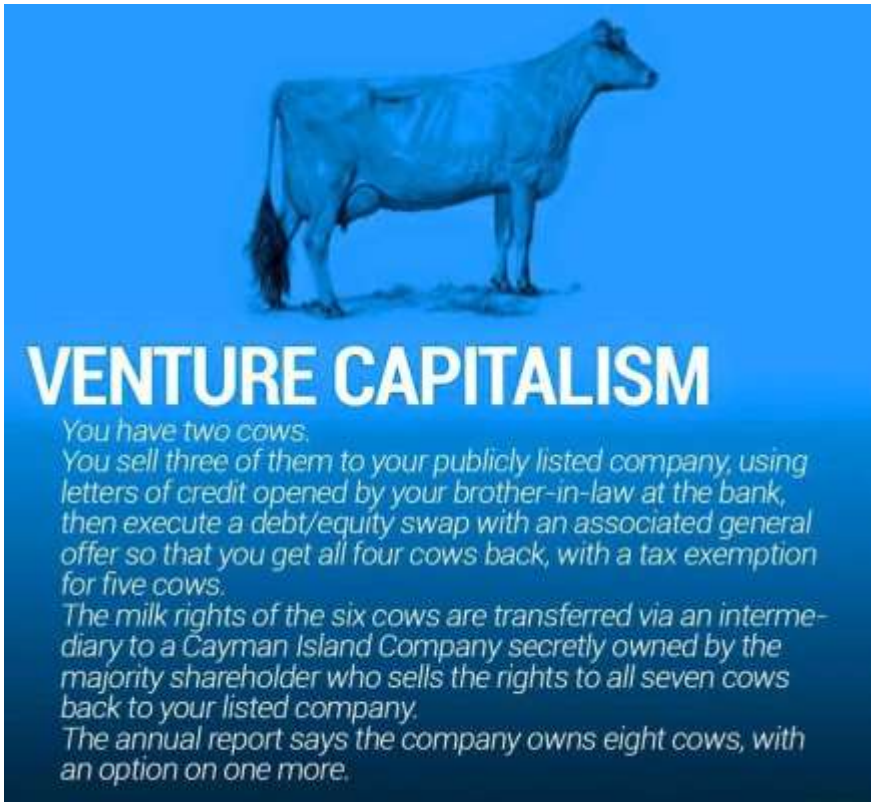
You have two cows.
One of them is a horse.

A SWISS CORPORATION

You have 5,000 cows.
None of them belong to you.
You charge the owners for storing them.

BUREAUCRATISM

You have 2 cows.
The State takes both, shoots one, milks the other and then throws the milk away.



Solo News

Two Wonogiri Mountains

On Sunday, 3 intrepid wanderers from STUPID boarded Kartini the Kijang about 8am, and set off for a couple of smallish mountains down in Wonogiri.

Our first was Bukit Cumbri, an interesting peak right on the border of East and Central Java. The drive was quite a long one, and the last 40km was slow on the windy road through hilly country behind the inevitable plodding trucks. But at last we arrived about 10.30, and immediately set off up the hill.

Left: The white trunk Ghost Gums

Right: Phil flys his drone from Cumbri

The climb is not hard at all, walking up on a dirt track through cashew nut plantations and, surprisingly, Australian ghost gum trees, so called because their smooth, pure white trunks look like ghosts in the moonlight. After about 20 minutes, we reached the first rocky outcrop, the very favourite selfie spot, where there is a flat rock, and magnificent views to the east.

The true peak of Cumbri is another rocky outcrop some 50m up

and to the west. The path between the two is narrow, and a little slippery with loose sand. On both sides are steep cliffs. It was pleasant up there, with a gentle breeze, and we sent up a couple of drones to get some interesting perspectives. Down again, regaining Mama Titin at her favorite bakso stand, and off we went into Purwantoro for a luncheon of soto ayam.

"Just like womens' breasts" says Phil of these mountans below Cumbri, he having made a study of the topic

The next venue was a mountain called Gunung Brojo. We had never done this one before, so that made it intriguing. Just out of Purwantoro, we turned off south and quckly started ascending on a narrow, but well paved road. It snaked ever upwards, through little villages, and past massive volcanic stones much bigger than any house. Eventually we reached a dead end, and asked some locals for directioins. We'd gone past the turnnoff. Nothing was signposted. Turning around was a bit of a hastle, it being steep and narrow, but luckily there was a house with a largish front courtyard, and some very surprised occupants.

A mile back at a three-ways was a sort of statue thingame, variously called a candle or a Monas statue by the locals. We parked the car, and were about to start walking up the road when a nearby lady informed us we could drive up further. This seemed a brilliant idea, but reversing out of the parking spot, Kartini managed to get herself stuck in a gutter.

The road to Gunung Brojo had huge volcanic rocks either side of the narrow road

Apparently there are very few men up there in them there mountains, only women and children. The males have all gone off to Jakarta to work as labourers on construction sites. A couple of lusty lasses volunteered to assist pushing, but somehow we managed to extradite ourselves, and proceeded up the hill to the house of one Mbak Yanti, who is the official Parking Person for Gunung Brojo.

The road from here continued a mile or so up to the top of the ridge, albeit somewhat attenuated. On the way there was a spectacular red flowering tree, with no leaves – just brillliant red. And many pine trees. At the top, we took one narrow path, but it ended up at a communications tower. So we tried another path, which reached the edge of the ridge, but there were no vistas – everthing obsured by big pine trees.

A brilliant red flowering tree on the way to Brojo

About to give up, we met up with a local guy, who showed up the correct track – somewhat obsure to be sure It wended its way through pine forests, and at

last came to the rocky outcrop that was Gunung Brojo.

On the upper slopes of Brojo they tap pine trees for resine and turpentine

On the peak of Brojo – little villages far below

It was well worth the effort. Straight down was the little town of Purwantoro, spread out at our feet like a map. To the east, you could see some hills, and then the vast plains of Ponorogo. To the north was the massive Jobolarangan mountain range, and then Lawu, though the latter was not visible that day due to storm clouds. Westwards were more hills, enormous cumulonimbus clouds and much rain. But the southern view was the best. Row after row of mountain ranges, each fading into a paler shade of blue, with cloud in some of the valleys way below us .

And so, in the fading light, we descended to the very friendly Parking Personage, retrieved Kartini the Kijang and Mama Titin, and drove the long windy way home to Solo. A very satisfying day.

SEA Matters

SEA Monthly Meeting

Venue: Lava Bar, Solo
Present: Don, Johannes, Frederik, Michael
Time: Friday 24 Sept, 3.00-4.00pm

1. SEA Christmas Party – Usually held in mid December, it was proposed to have a more European style Christmas party this year. Maybe hire a villa with a pool. Perhaps a barbeque. SEA to sell beer.
2. SEA Barbeque. This will be held this coming Sunday at Michael's Monster House from 1pm onwards. Decided on hamburgers, hot dogs and kebabs for the price of 50,000 per pax, and beer and softdrinks on sale.
3. Kereta Kelinci – scheduled for Sunday October 30. Michael to make enquiries as to the cost. Beer and music to be organised.
4. Laptops from Singapore – 8 schools have submitted their information for the 100 refurbished computers that we are going to distribute gratis. Import licensing is proceeding.
5. Zoo donation – The Rp20 million will be presented to Pak Bimo, the director of the zoo at a press conference on Friday 1 October. Pak Bimo will arrange a special 2 year free pass for Berry and family to visit the zoo. Presentation starts at 1pm with a lunch provided by the zoo, and the ceremony at 2pm. All welcome.
6. Next monthly meeting 6.30pm 8 October at Manir's Family Kitchen

Rewards For Getting This Far

Quote: "Women are made to be loved, not understood.. - Oscar Wilde

Thought for the week: If you can't get a lawyer who knows the law, try and get one that knows the judge.

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