

**SPECIAL
ARTICLE**

WHAT YOUR
BONES HAVE
IN COMMON
WITH EIFFEL
TOWER?

MENTOR

KNOWLEDGE MULTIPLIES IN SHARING

FEBRUARY 2017 ISSUE # 2

THE MAJESTIC FALLETTA

A PHOTOGRAPHIC ESSAY

**CIVIL
ENGINEERING**
GHENSEL
BRIDGE

EQ
11 HABITS OF
TRULY HAPPY
PEOPLE

PHARMACY
SITUATIONAL ANALYSIS
OF CURRENT PHARMACY
PRACTICE IN
ERITREAN HOSPITALS

FEBRUARY'S QUOTE OF THE MONTH

With
each DROP
of your
Knowledge,
we
will create the
ocean.



Send your Articles at
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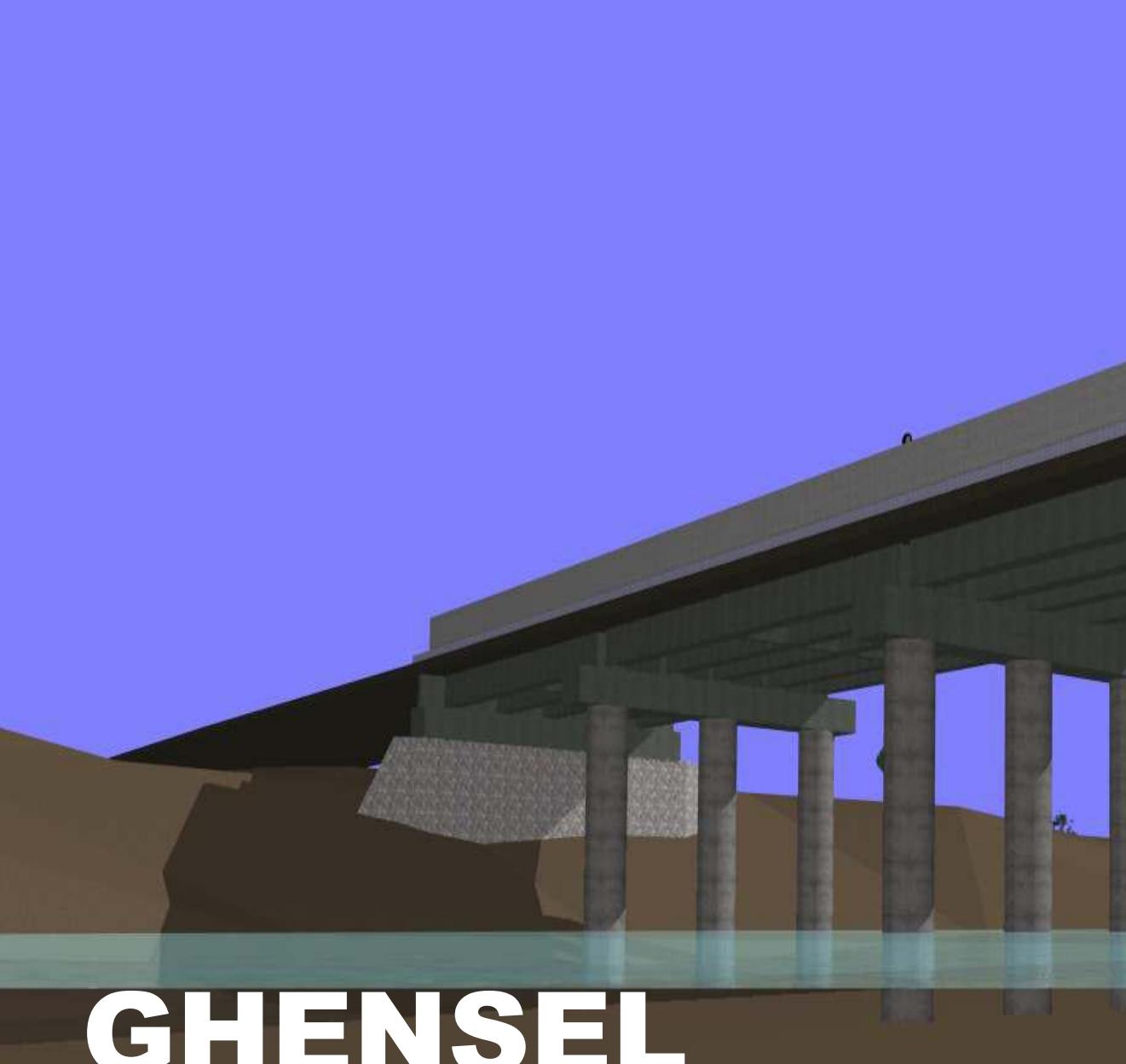
Editor's Letter

Dear Readers, this February edition of MENTOR, is adding new diverse topics from the previous editions, which focused more on engineering projects. In this month's edition, we are introducing for the first time activities from the pharmaceutical community. Moreover, another fabulous citscape photographic essay of one of the most distinguished buildings in Asmara. Eiffel's towers unique beauty and its connection with human anatomy is also a must read.

We are also very delighted to tell our readers that this month's edition and all the previous ones can be read and downloaded for free at eriyouth.org.

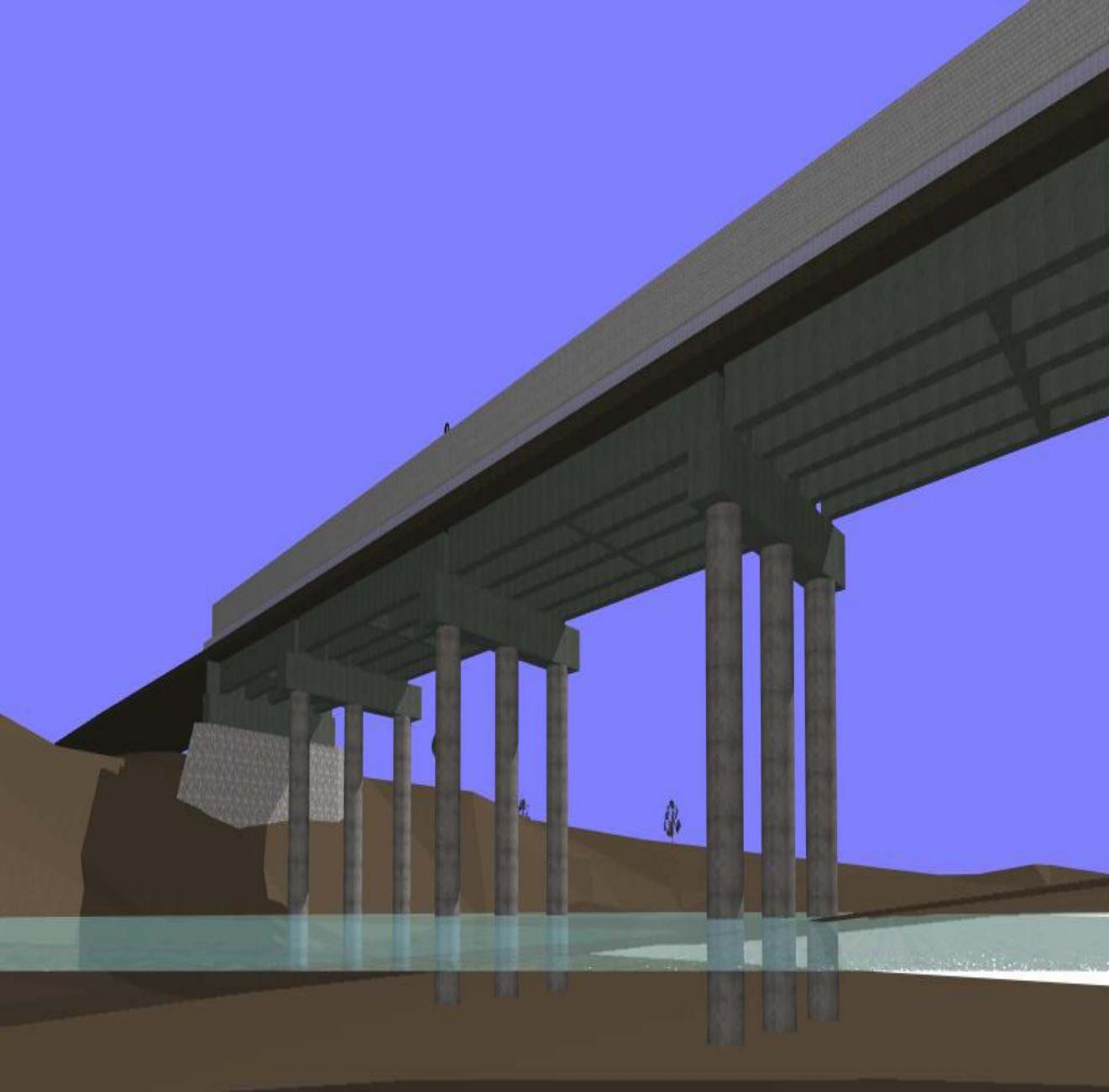
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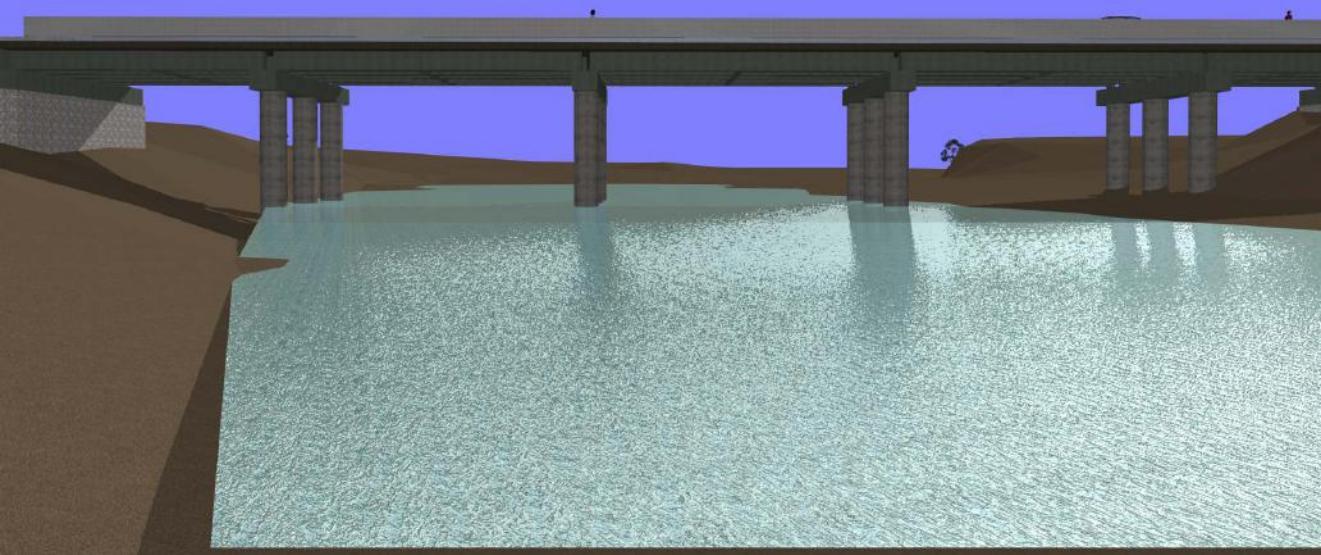
Saba Tekeste



GHENSEL BRIDGE

**AWET GHEBREHIWET, AZIEB SOLOMON, EDEN
TEWELDE, OKBAZGHI TSEGAY, SAMUEL TEKESTE
AND YOEL MICHAEL**





WHAT IS A BRIDGE?

A bridge is a structure built to span physical obstacles without closing the way underneath such as a body of water, valley, or road, for the purpose of providing passage over the obstacle. There are many different designs that each serve a particular purpose and apply to different situations. Designs of bridges vary depending on the function of the bridge, the nature of the terrain where the bridge is constructed and anchored, the material used to make it, and the funds available to build it.

WHAT DO WE CLASSIFY AS A BRIDGE?

A structure that spans greater than 6m is classified as a Bridge.

TYPES OF BRIDGES

Bridges can be categorized in several different ways. Common categories include the type of structural elements used (the way it carries and transfers load), by what they carry, whether they are fixed or movable, and by the materials used.

Major classification is based upon structure type (the way it carry loads)

- 1. Beam Bridge (Including Girder Bridges)**
- 2. Cantilever Bridge**
- 3. Truss Bridge**
- 4. Arch Bridge**
- 5. Tied Arch Bridge**
- 6. Suspension Bridge**
- 7. Cable Stayed Bridge**

TYPES OF BRIDGES IN ERITREA

Bridges in Eritrea emerged as the road networks were constructed along routes between different towns. Most of them were built during the Italian colonization. The types mostly used were Arch, Tied-Arch and Girder Bridges. But after the independence bridge types like Prestressed, Girder and Steel Bridges were introduced.

GENSEL BRIDGE PROJECT

The proposed site is located 85Km from the capital city of Eritrea, Asmara. An existing ford was used to serve as crossing. There were two major reasons for proposing a bridge.

Since a very long time in history the flood from Ghensel river has been a great obstacle to the residents of the mai-aini sub zone. The flood has taken many human lives and live stocks. During summer season due to high flood road user are enforced to wait the flood from three hours to three days depending on the amount of flood. Three hours a very long time for sick people and for pregnant women whose delivery is due. So the first reason is to solve transportation problem along the route especially during rainy season.. Secondly Eritrea's main economic growth depends on irrigation. One of the most fertile and irrigable lands are the Hazemo Plains , but because of the unsafe road, investors are not encouraged to do business in that area. Therefore to utilize the products of these plains throughout the year a bridge has to be built.

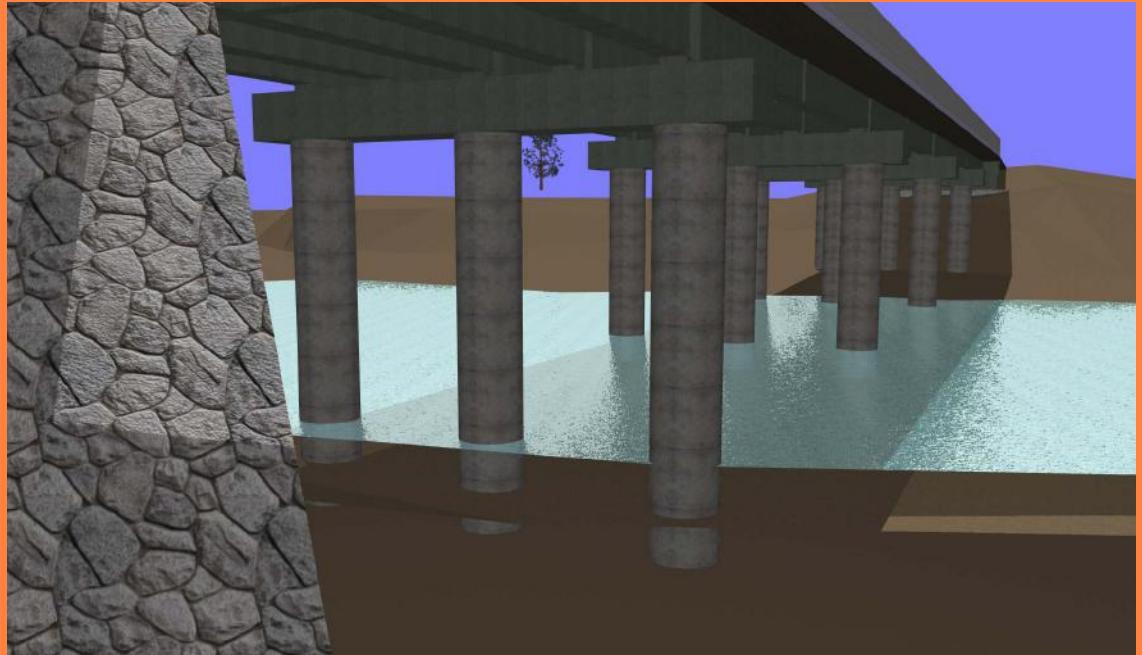
ADVANTAGES OF BRIDGE IN THAT AREA

- * It will greatly reduce travel time
- * It will encourage investors to do business in that area as a result the economy of the subzone can be improved
- * It will help road users to have safe , comfortable and efficient trip
- * During high flood pedestrians can use side walk of the bridge
- * In special occasions high traffic can occur so the bridge can accommodate this traffic
- * Bridge is an infrastructure that attracts tourists
- * The bridge will add beauty to the landscape
- * Sick people and pregnant women can travel to nearby hospitals in time
- * The bridge will eliminate unwanted deaths and accidents
- * The obstruction in the bridge will train the high flood so downstream erosion will be minimized so downstream harvesting area will be safe

SITE SELECTION

The two main factors were that the river meanders all over its course and an existing alignment is present. Due to known reasons a bridge should be located as far as possible from meandering zones. After thorough investigation it was found out that there As the ideal bridge requirements are not available on ground a least

IN PICTURES



A side view depicting how the pillars are distributed over the river



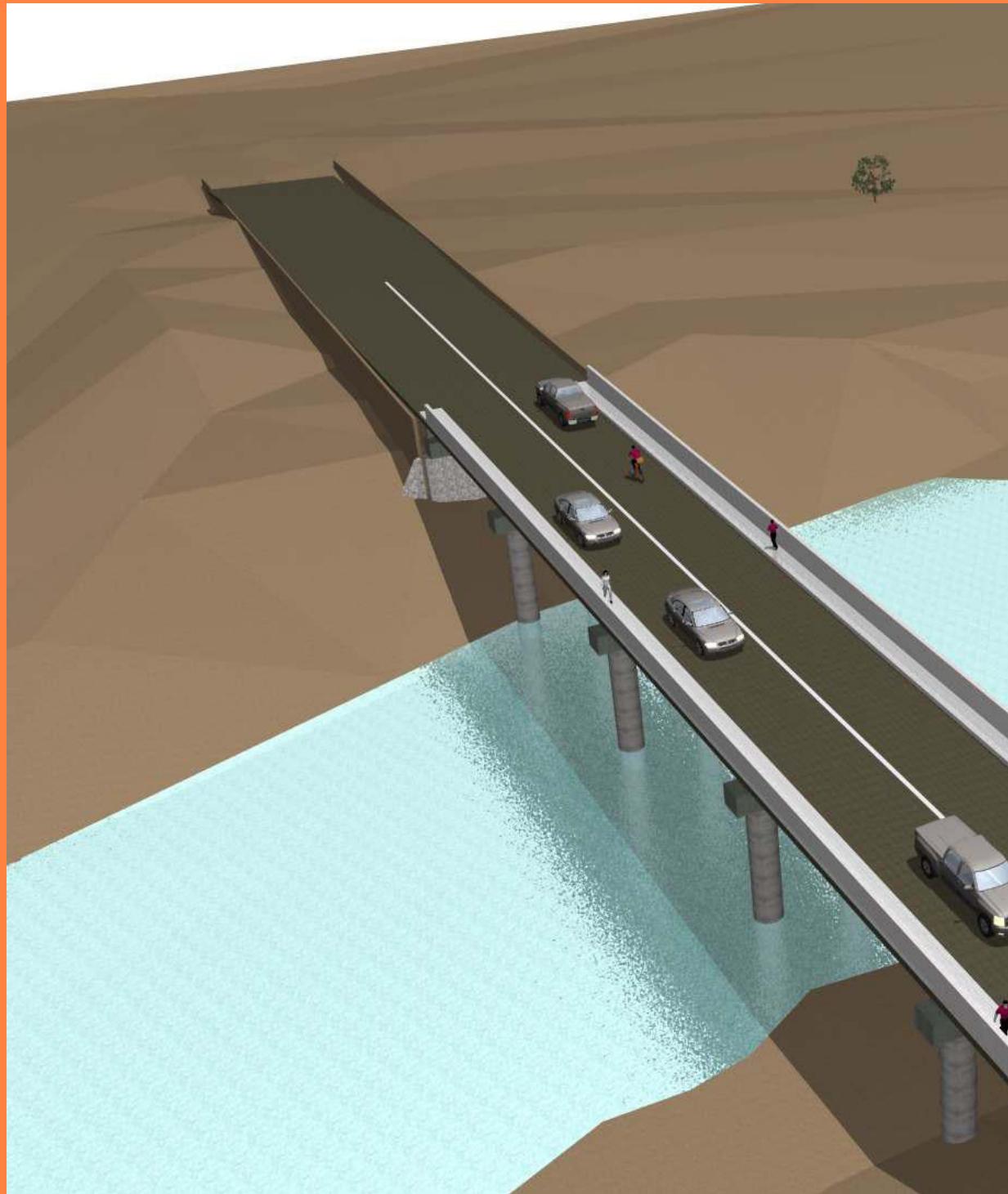
A top view of the bridge

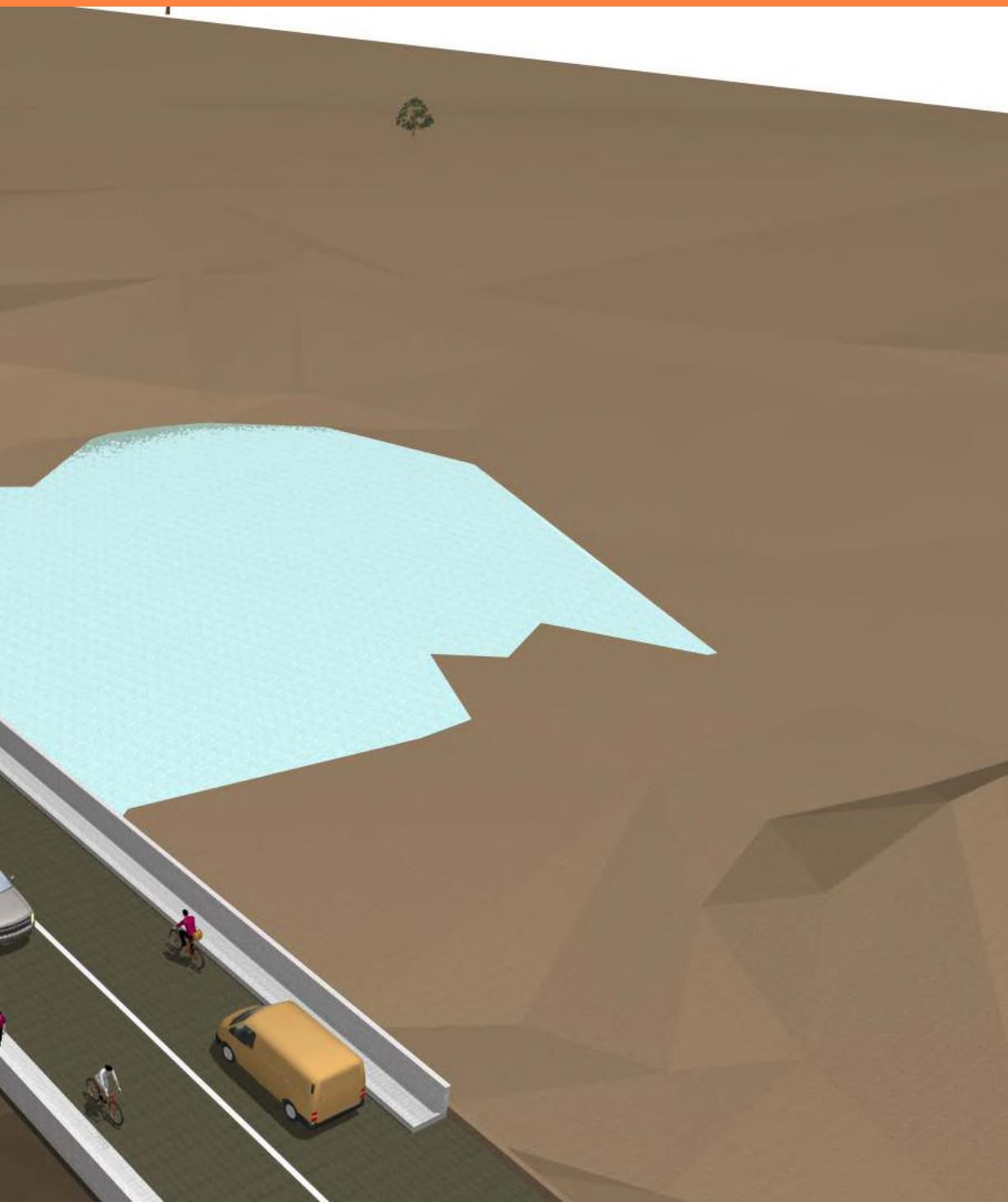


An Aerial view with the landscape in background



A 3D top view depicting cars and people on bikes moving atop the bridge





objectionable site were selected based on engineering judgment. The critical factors considered were cost of realignment, river training works, flow characteristics and economic factors.

HYDROLOGY

Hydrologic analysis were done to determine the peak discharge. The main problem was no available gauged rainfall data near the site. The peak discharge were determined using transfer and regression methods. There were a 40% variation between those two methods. To arrive at a reasonable result, highest flood marks were considered and discharge was computed. The results were similar to the one computed by the transfer method. So that result was adopted.

HYDRAULIC ANALYSIS

Hydraulic analysis were done to maintain undisturbed flow through the bridge. Based on the available data Highest Flood Level (HFL), afflux, and scour depth were computed. And also river training works were designed.

TYPE OF BRIDGE AND STRUCTURAL DESIGN

The total span of the bridge determined is 69m (with five spans the 3 central span are of 15m and 12m on each abutment side). Therefore, from the various types of bridges Girder Bridge was adopted taking into consideration the aesthetic, economic and availability of construction materials

factors.

The design method was LRFD .The carriageway was 10m including 1.25m sidewalk on each side.

CHALLENGES

- As there were no funds for this proposal the site visits arranged were not enough
- Subsoil and geotechnical investigation were not carried out because of its cost.
- Topographic map prepared was not sufficient for detail analysis and design
- Hydrological data computed were based on nearby station (Mereb Debarwa) so accurate raw data was not available.
- Enough senior consultants didn't participate.

SOFTWARES AND TOOLS

AutoCAD 2007-2012

STAAD.ProV8i

Eagle Point 2007

Excel Spreadsheets

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2. B.L GUPTA AND AMIT GUPT, Design of Highway Bridge (Based on AASH-TO LRFD Bridge Specifications)
3. RICHARD M.BARKET AND JAY A. PUCKET

Quote of the MONTH

"I would prefer even to fail with honor than win by cheating."

Sophocles

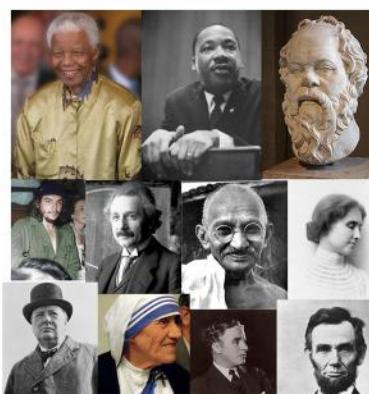
Greek Philosopher

497- 406 BC

Cheating has never been a virtue! It is amazing to see early people such as Sophocles were aware of this fact. Avoidance of cheating is not an easy choice; it entails the determination to accept failure with honor. So, it is time to ask ourselves how fair and honest have we been in the past? From exam halls to office queues, how many times have we ‘made’ our way by cheating? Let’s halt our advance and think over again what Sophocles is saying to us!

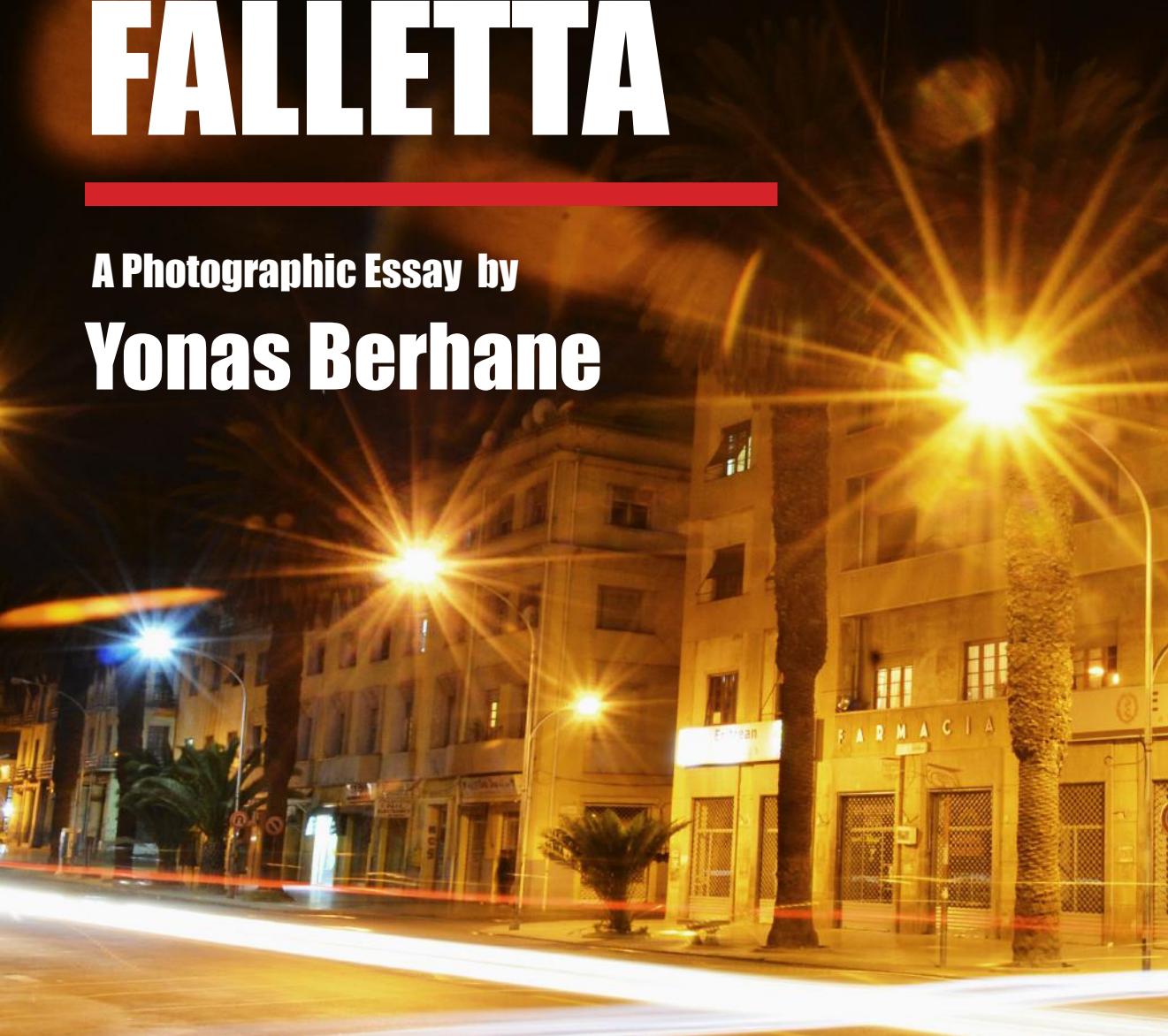
“ Send us
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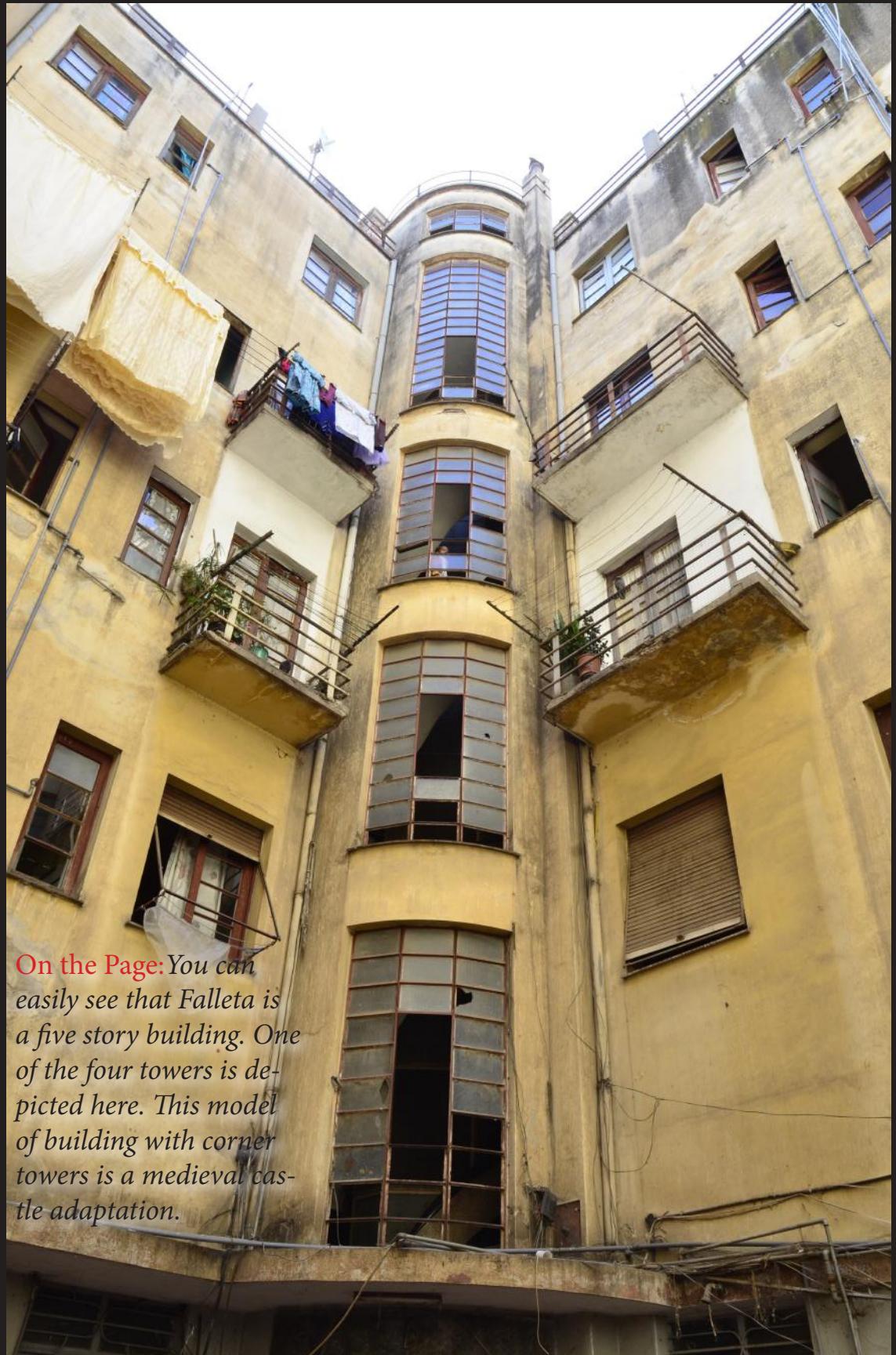
THE MAJESTIC FALLETTA

A Photographic Essay by
Yonas Berhane



Situated in Harnet Avenue, Falletta neighbours the famous Asmara Cathedral, another magnificent piece of architectural work.





On the Page: You can easily see that Falleta is a five story building. One of the four towers is depicted here. This model of building with corner towers is a medieval castle adaptation.





DID YOU KNOW THAT?

The name for the building comes from Falletta was the prominent Italian businessman Salvatore Falletta, whom the buidling was originally designed for.

Up: Old postboxes at one of the gates. **To the Right:** Look how the glass curves along the back-wall and the stairs. **Below:** Building top zoomed in.



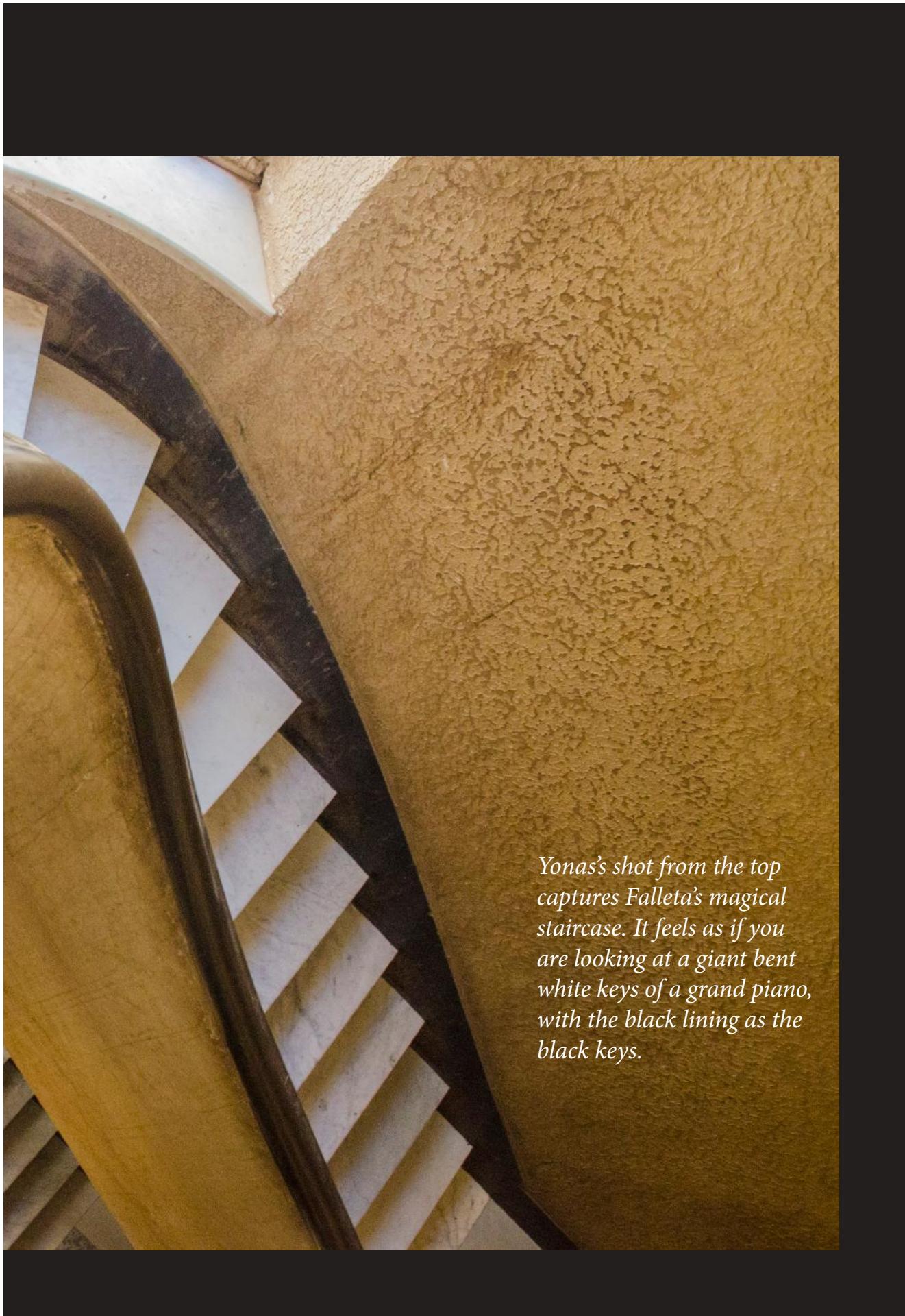


FALLETTA in **DAY & NIGHT**



THE MAGNIFICENT STAIRCASE



A photograph of a spiral staircase viewed from above. The stairs are arranged in a spiral pattern, with each step consisting of a white rectangular plate and a dark, curved base. The perspective creates a visual effect similar to looking down at the keys of a grand piano.

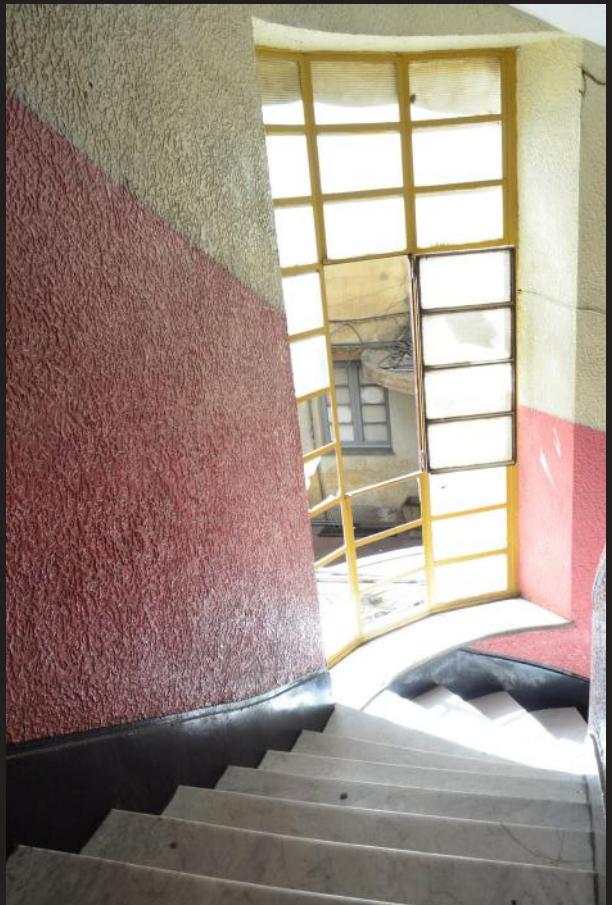
Yonas's shot from the top captures Falleta's magical staircase. It feels as if you are looking at a giant bent white keys of a grand piano, with the black lining as the black keys.





THE DESIGNERS:

Falletta is the creation of three architectural minds: Giuseppe Cane (1937); Carlo Marchi (1937-38); Aldo Burzaglio (1938); and A. Fulgini (1961) during its renovation.



THE LIFT

Currently out of order

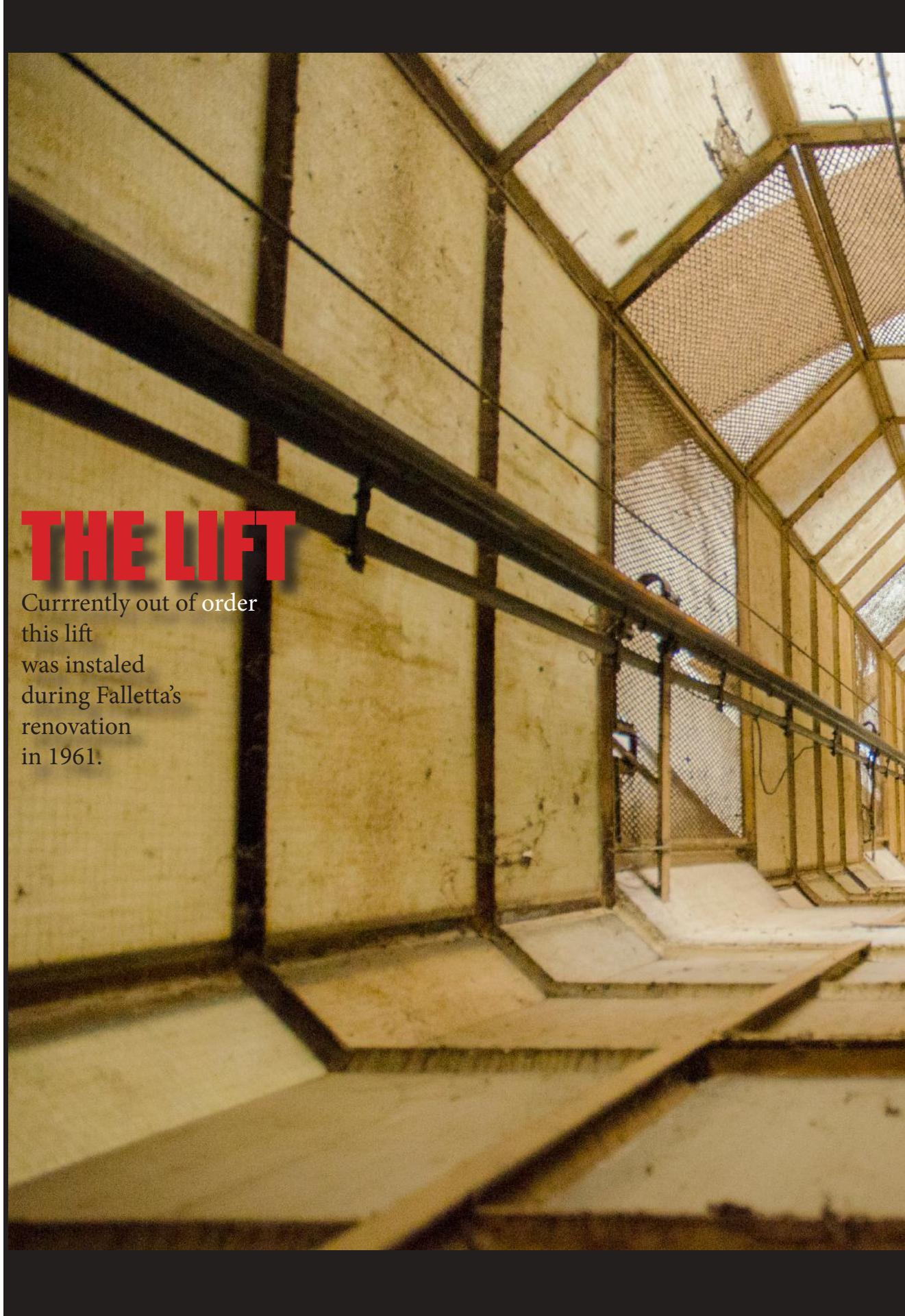
this lift

was installed

during Falletta's

renovation

in 1961.







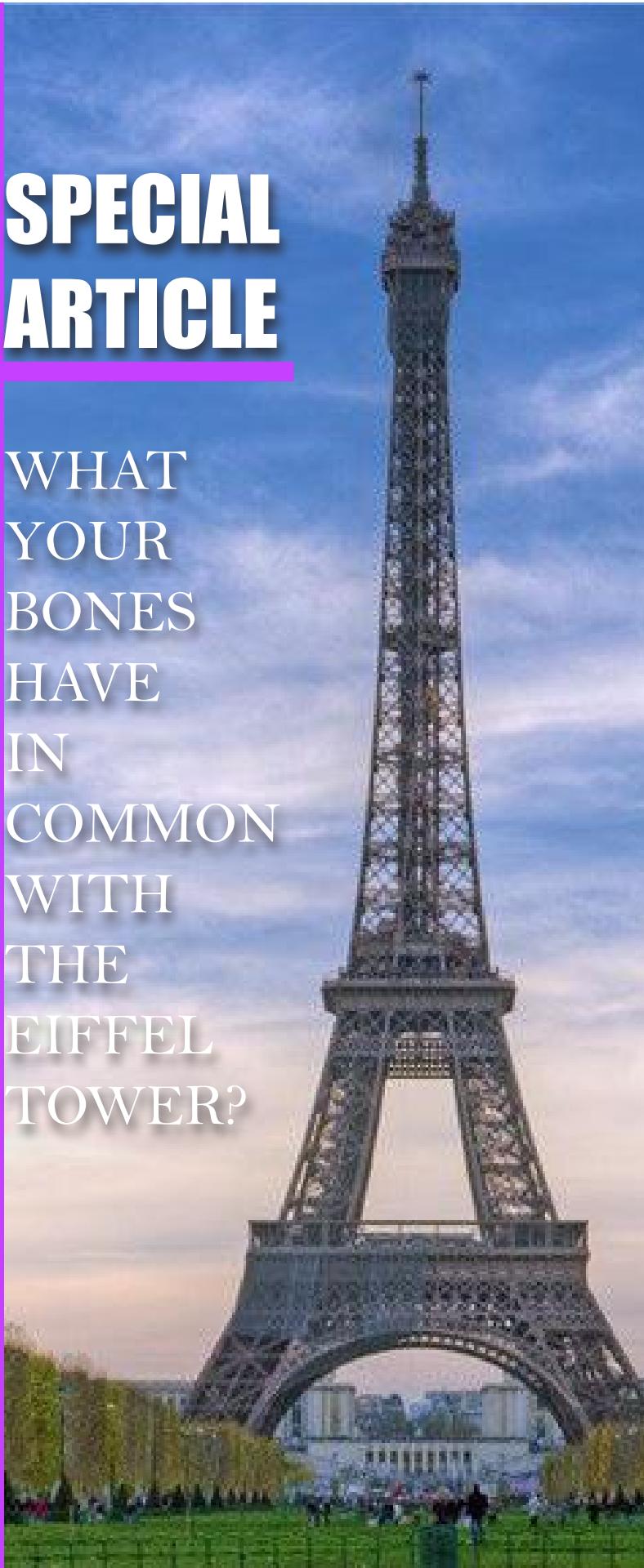
THE **SQUARE**

See for yourself how a bit distorted the square is. This upward shot from the central courtyard is beyond words.



SPECIAL ARTICLE

WHAT
YOUR
BONES
HAVE
IN
COMMON
WITH
THE
EIFFEL
TOWER?



Everyone loves the Eiffel Tower. Its classic, iconic shape is an instantly recognizable symbol of Paris. A lot of articles had written before about its facts, technical data and other related information. But in this article Eiffel's elegant design is going to be presented. To modern eyes, the tower's shape is elegant and graceful, perhaps even timeless. But to contemporary critics it was a monstrosity. The tower represented a new kind of aesthetic, and it took people a while to appreciate this. Eiffel was going after a deeper kind of beauty, a kind that wasn't just skin deep. His notion of beauty had to do with economy and structural efficiency, with achieving the greatest strength with the least possible material. It had to do with seeing pure, efficient, well-engineered structures as works of art.

HIDDEN RULES OF HARMONY

Here's Eiffel describing his new aesthetic, in response to his critics.

Are we to believe that because one is an engineer, one is not preoccupied by beauty in one's constructions, or that one does not seek to create elegance as well as solidity and durability? Is it not true that the very conditions which give strength also conform to the hidden rules of harmony? [...] there is an attraction in the colossal, and a singular delight to which ordinary theories of art are scarcely applicable.

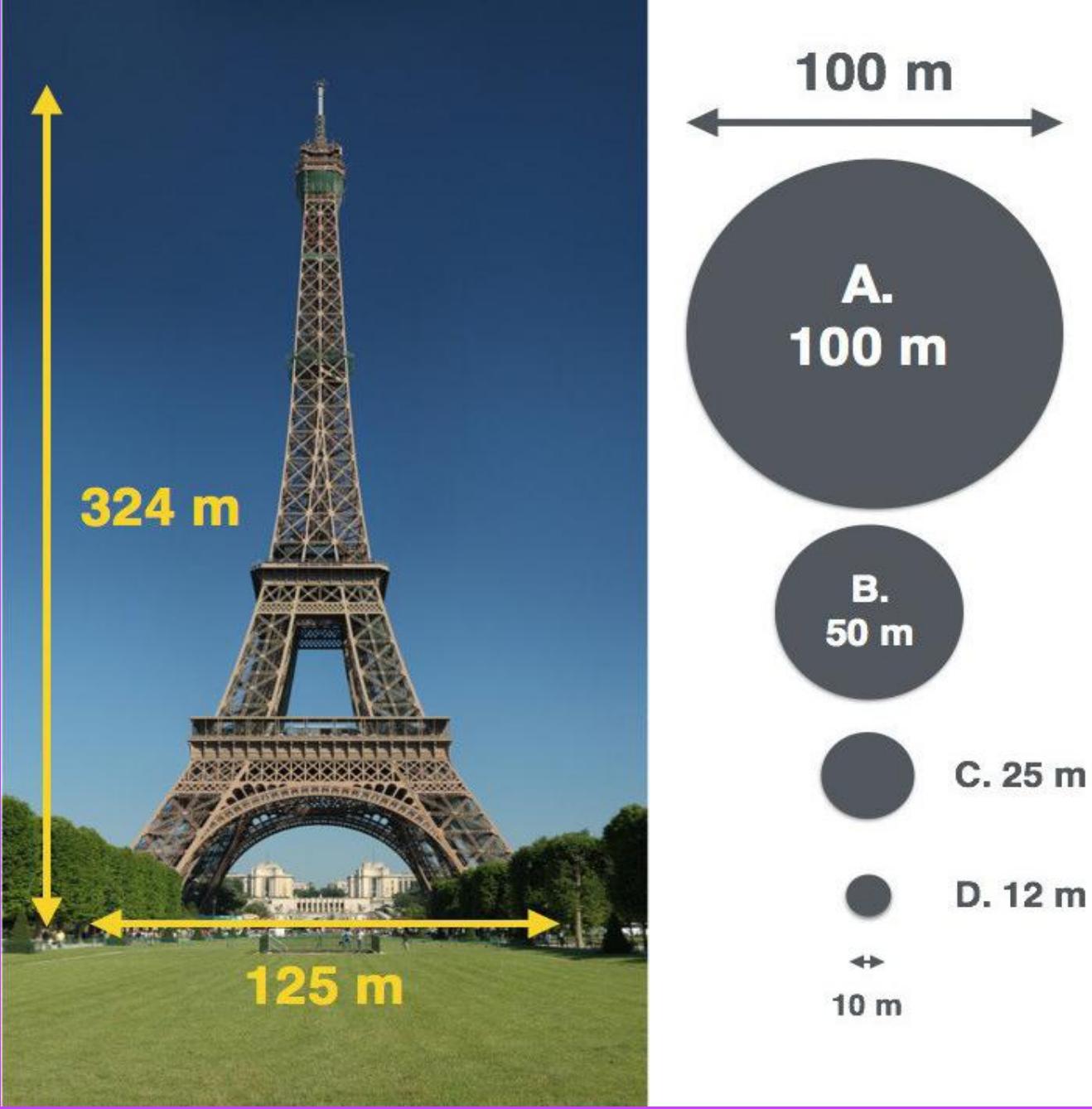
The Eiffel tower is incredibly well optimized to do what it was designed to do, to stand tall and stand strong, while using a minimum of material. Rather than hide its inner workings with a facade, Eiffel exposed the skeleton of his masterpiece. In doing so, he revealed its "hidden rules of harmony", many of the same rules that give your skeleton its lightweight strength.

"There is an attraction in the colossal, and a singular delight to which ordinary theories of art are scarcely applicable."

To understand Eiffel's ingenious design, let's start with a little puzzle. Imagine that someone melted all of the iron in the tower into a solid ball. How big do you think that ball would be?

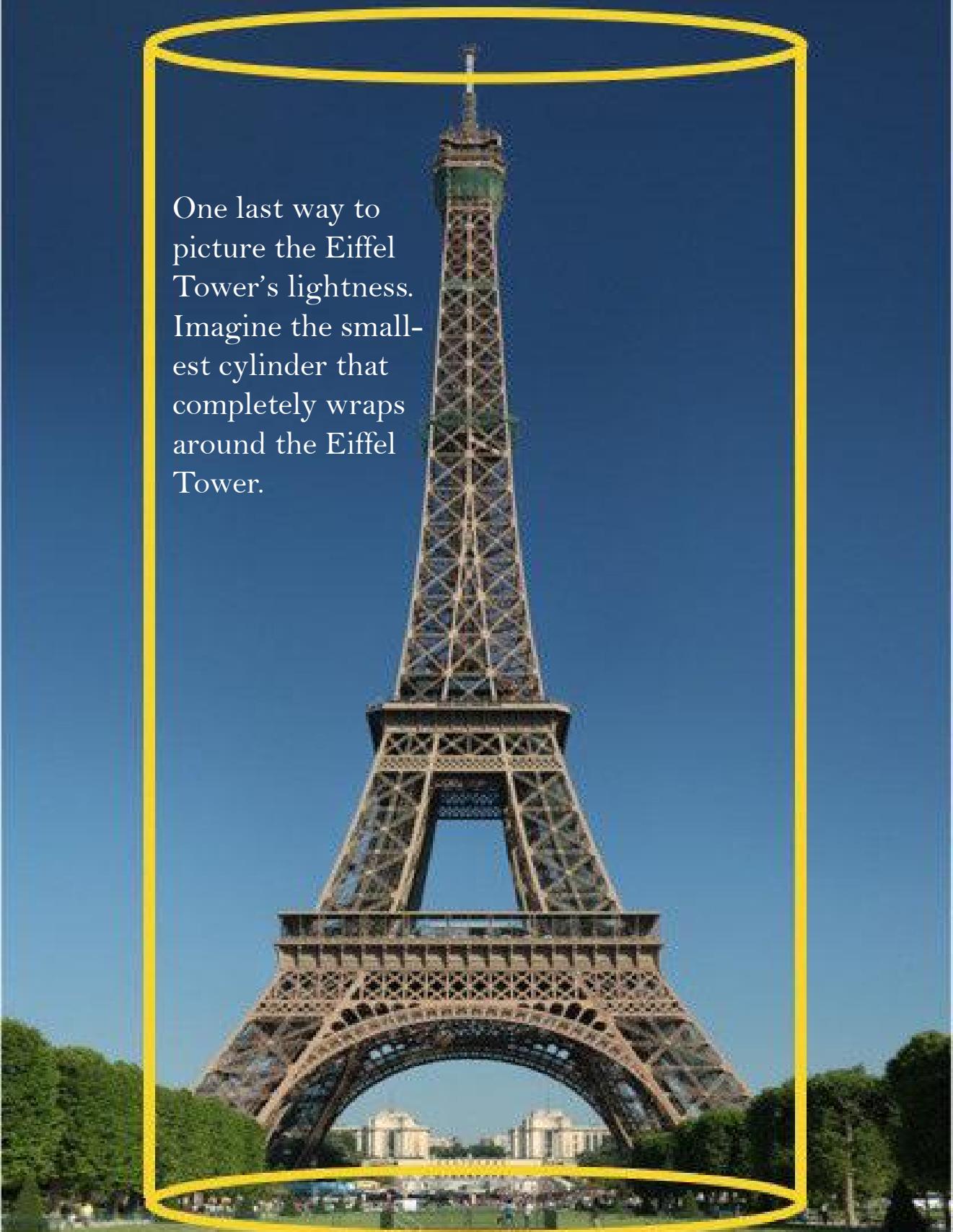
Each of the balls shown in the image are drawn to scale, next to their diameters.

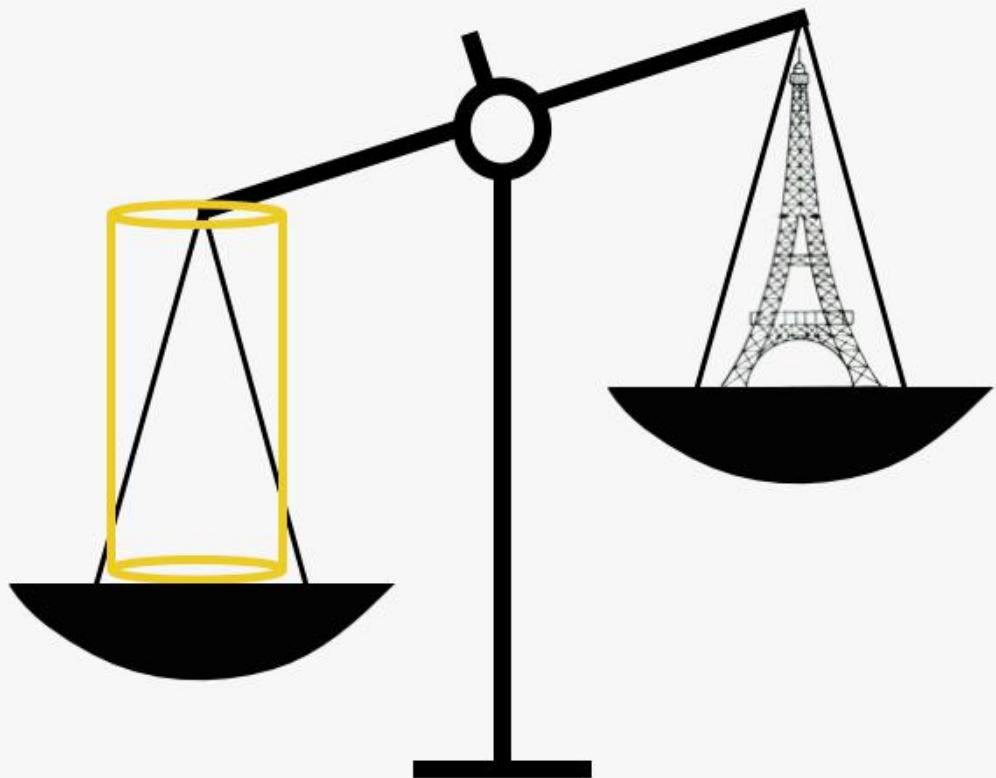
Before reading any further, take a moment to guess your answer



The correct choice is D. If you melted all the iron in the Eiffel Tower into a ball, it would be just 12 meters (less than 40 feet) in diameter. The tower's immense height (324 meters, or over a thousand feet) belies the fact that it's incredibly light for its size. To see it another way, if you were to melt the Eiffel Tower's iron into a rectangular block as big as its base, then that block of iron would be only 6 centimeters (2.4 inches) tall. It wouldn't even be visible in the image above.

One last way to picture the Eiffel Tower's lightness. Imagine the smallest cylinder that completely wraps around the Eiffel Tower.





Now think about this. The air in this tube outweighs all the iron in the tower. So how did Eiffel design a structure that's strong enough to withstand the elements, and yet weighs about as much as the air surrounding it?

The secret lies in understanding the shapes of strength. It's a lesson we can learn by looking inwards... literally. By studying our bones, we can discover some of the same principles that Eiffel used in designing his tower.

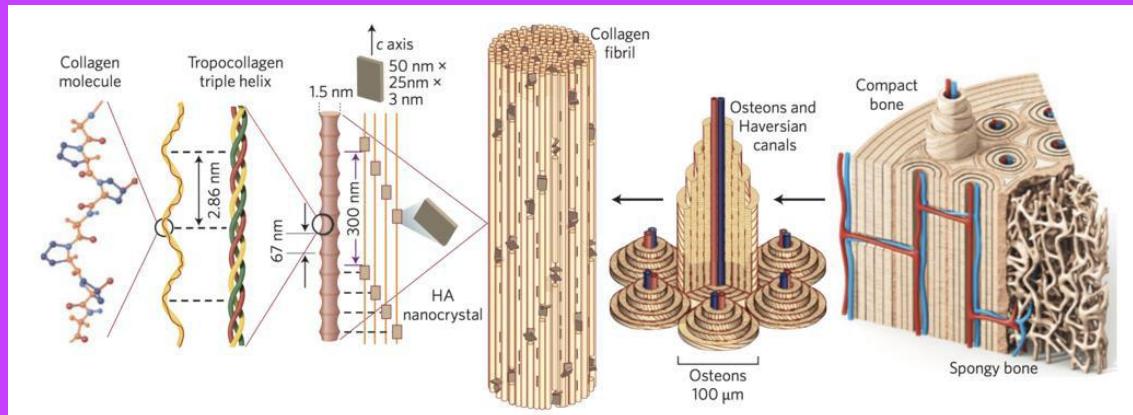
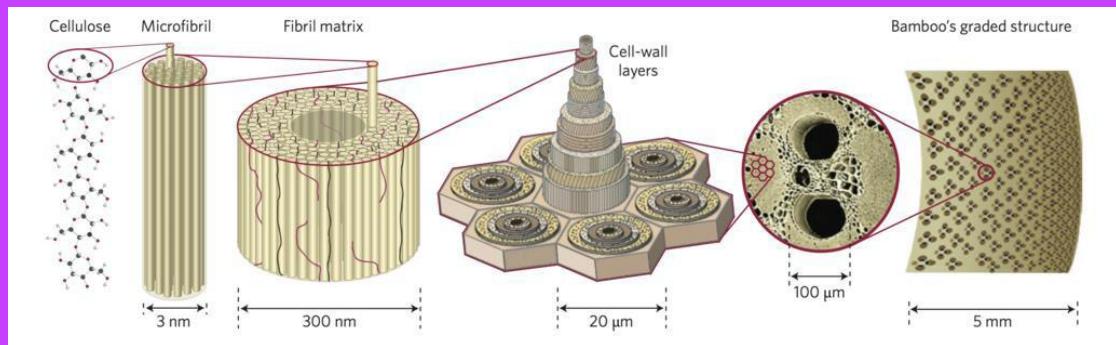
SHAPES WITHIN SHAPES WITHIN SHAPES...

If you slice a bone open, you'll find that it's kind of like a baguette – hard on the outside and spongy on the inside. The outer bone material is hard and compact. This compact bone does most of the heavy lifting for the bone. On the interior

is a spongier bone material. This spongy bone also plays an important role in carrying the pushing and pulling forces that our bones constantly endure.

Now let's zoom into the crust of that bone baguette – the compact bone. It's made up of tiny tubes called osteons, each just 2 tenths of a millimeter across, with a blood vessel running down the middle. Zooming further into the walls of these osteons, we find that they're made out of tinier bundles called fibrils. Zoom further still, into one of these fibrils, and we see that they're really a bundle of fibers, and each fiber is really three interwoven strands. Pull these strands apart, and we've unweaved our bones into its most fundamental unit, a long chain-like molecule called collagen.

This fractalesque way of putting things together, building with materials that

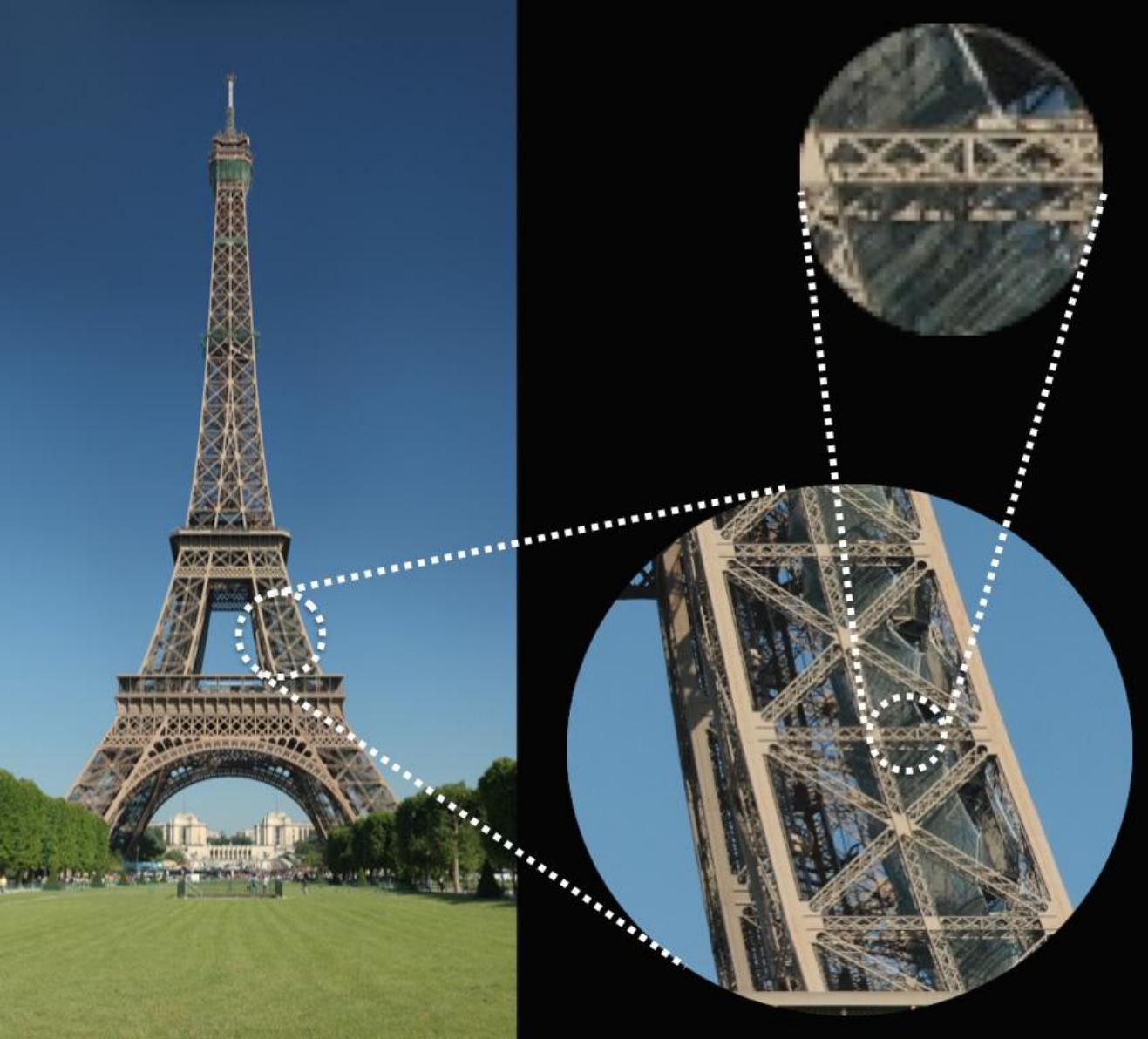


are self-similar as you keep zooming in, is known as structural hierarchy. And it's this structural hierarchy – tubes within tubes within tubes within tubes – that gives our bones their lightweight strength. (The spongy bone also has a fractalesque, self-similar design. If you look at a piece of it under an electron microscope, you'll find that it looks just as spongy.)

Bamboo exploits the same idea. This ultra-fast growing grass needs a way to minimize material and stay very light, so it can grow tall and not collapse under its own weight. Bamboo's hollow tube shape is a very efficient way to create stiffness. And like bone, bamboo is made out of tinier tubes, which in turn are made out of bundles of fibers, that are each made of out even smaller bundles of fibers, and so on. When you unweave a bamboo down to its tiniest thread, at the scale of a nanometer, you arrive at another long chain-like molecule – cellulose.

Bamboo and bone are both natural nano-engineered materials that use structural hierarchy to achieve their lightness and strength. The Eiffel Tower uses a similar idea. Eiffel borrowed this notion from bamboo and bone (although he probably arrived at it independently), and put it to use on a colossal scale.

Like many modern structures, the Eiffel Tower uses an arrangement of criss-crossing 'X-shaped' beams known as a truss. This is a very efficient way to engineer structures by relying on the inherent strength and stability of triangles. If you zoom into one of the Eiffel Tower's trusses, you'll find that they aren't as solid as they seem – each of them are made up out of smaller, similar trusses. The material has more holes than it has iron. This hollow form contributes to the tower's mind-boggling lightness. The next time you go over a bridge, look carefully, and you're likely to see the same idea at play.



SHAPED BY THE WIND

Once you've figured out how to build a lightweight tower, how do you ensure that it stays standing? The Eiffel Tower has to contend not just with gravity but with the considerable toppling force of the wind. To counter this, its sloping curve closely follows the most efficient shape for resisting the wind.

The trick to building a well engineered structure lies in transferring the forces from where you don't want them to act to where you want them to act. Eiffel understood this. The shape of his tower has the

special property that the combined force of the wind and the tower's own weight will flow down the legs of the tower, all the way down to the strong foundations. (In physics terms, the tower has just the right shape so that the torque, or toppling tendency, generated by the wind is balanced by the torque due to its own weight.)

In the interview where he responds to his art critics, Eiffel describes this idea.

"Now to what phenomenon did I have to give primary concern in designing the Tower? It was wind resistance. Well then! I hold that the curvature of the monu-

ment's four outer edges, which is as mathematical calculation dictated it should be [...] will give a great impression of strength and beauty [...]"

That's My Crane!

By understanding how forces flow, Eiffel's engineers could design an optimal structure, putting stuff only where it's needed, and leaving it out where it isn't. The method that they used to visualize the flow of forces has a curious connection with the science of bones. It's described in D'Arcy Thompson's *On Growth and Form*, a delightful and insight-packed 1000+ page treatise on the mathematical laws that govern biology, published in 1917.

"A great engineer, Professor Culmann of Zürich, to whom by the way we owe the whole modern method of "graphic statics," happened (in the year 1866) to come into his colleague Meyer's dissecting-room, where the anatomist was contemplating the section of a bone. The engineer, who had been busy designing a new and powerful crane, saw in a moment that the arrangement of the bony trabeculae [spongy bone] was nothing more nor less than a diagram of the lines of stress, or directions of tension and compression, in the loaded structure: in short, that Nature was strengthening the bone in precisely the manner and direction in which strength was required; and he is said to have cried out, "That's my crane!""

When an engineer looks at a structure, she looks beyond the material and sees the forces that act on it – it's a bit like owning a pair of X-ray goggles. These forces come in two types – pushing forces that squeeze an object inwards, and pulling forces that stretch an object outwards. Every physical object that you encounter, from a table or a chair, to a bridge or a

skyscraper, is basically a big party of these pulling and pushing forces (or as engineers refer to them, tension and compression forces).

So when Culmann was designing his crane, he was using his newly devised method of 'graphic statics' to map out these push and pull forces. And this is what he drew.

On the left is a drawing of the push and pull forces in the crane he was studying. And on the right is a similar drawing of push and pull forces in the top of the thigh bone (the femur). These images, adapted from Culmann and Wolff's publication in 1870, represent the first collaboration between an engineer and an anatomist.

So when Culmann saw the pattern of the spongy bone in the top of the thigh bone, it reminded him of his crane. He was immediately struck by how clearly he could see the criss-crossing lines of forces in the bone.

When it comes
to engineering,
we still have a
lot that we can
learn from our
bones.

The spongy interior of your thigh bone is efficiently arranged so that the material is present where the forces are the greatest, and absent where there aren't any forces. In bone, this process occurs gradually over its development. The spongy bone hardens and aligns in directions where it experiences the greatest force, and atrophies in places where it isn't used. There's an analogy here to how those impressive sandstone arches are carved by the wind. The wind carves away places where the stone is least stressed, leaving in place a three dimensional outline of the lines of force, where the stone is most densely compacted.

In recent years, the mathematical exactness of this relation between bone and force has been called into question. But the general principle, that bone adapts to its functional demands, and that bone structure corresponds to the forces it experiences, is still widely accepted. What does this have to do with Eiffel? Well, Culmann's approach of graphically representing the push and pull forces was a powerful new tool, one that's still used today. One of Culmann's students, Maurice Koechlin, worked for Eiffel. And it was Koechlin who sketched the original concept of the Eiffel Tower, drawing from his training in visualizing forces. The same tools that Culmann developed and used to understand bone were later used by Eiffel's engineers to design a tower that minimizes the use of material.

So while the critics who called Eiffel's tower a skeleton meant it as insult, it's actually quite the compliment. When it comes to engineering, we still have a lot that we can learn from our bones.

Source (www.wired.com)

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11 Habits of Truly Happy People

Human Behaviour in Numbers

In the following series, Dr. Travis Bradberry's captivating lessons on Emotional Intelligence will be covered. Dr. Travis Bradberry is an award-winning co-author of Emotional Intelligence 2.0 and the co-founder of TalentSmart® the world's leading provider of emotional intelligence tests and training serving more than 75% of Fortune 500 companies. His bestselling books have been translated into 25 languages and are available in more than 150 countries.

When we think of happiness, we typically think of things that bring us immediate pleasure—a decadent meal, a favorite book, or a relaxing day on the beach. These pleasures do bring happiness, but only temporarily. Recent studies have shown that true happiness, or life satisfaction, works a bit differently.

In one study, University of Pennsylvania psychologist Martin Seligman categorized hundreds of people into three groups based on how they pursued happiness:

The Pleasant Life: People in pursuit of the Pleasant Life seek happiness by looking for pleasure. They are good at savoring the moment and making their pleasures last.

These people are often described as “thrill-seekers.”

The Engaged Life: People in pursuit of the Engaged Life seek happiness by working hard at their passions.

They immerse themselves so deeply in these that they sometimes come across as cold and uncaring; but for them, time seems to melt away as they experience a state of total engagement.

The Meaningful Life: People in pursuit of

the Meaningful Life use their strengths to work toward something they believe contributes to a greater good. This greater good motivates them deeply.

Seligman found that people who pursued the Pleasant Life experienced little happiness, while those who pursued the Meaningful Life and the Engaged Life were very happy.

While Seligman's research is just a single study, it shows that where you focus your energy and attention has a big impact on your happiness. Those who pursued the Engaged Life and the Meaningful Life had something important in common—they were deeply passionate, and they used their strengths to better themselves and the world around them.

Indeed, happy people are highly intentional. If you want to follow in their footsteps, learn to incorporate the following habits into your repertoire.

1 | Create your own happiness (don't sit back and wait for it).

Every second you waste waiting for happiness is a second you could have been using to create it. The happiest people aren't



the luckiest, wealthiest, or best-looking; the happiest people are those who make an effort to be happy. If you want to create your own happiness, you have to start by making it a priority. We work so hard to avoid letting other people down, but we so often do so at the expense of our own happiness.

2 | Surround yourself with the right people. Happiness is contagious. Surrounding yourself with happy people builds confidence and stimulates creativity, and it's flat-out fun. Hanging around negative people has the opposite effect—they want people to join their pity party so that they can feel better about themselves. Think of it this way: If a person were smoking, would you sit there all afternoon inhaling the secondhand smoke?

3 | Get enough sleep. I've beaten this one to death over the years and can't say enough about the importance of sleep to improving your mood, focus, and self-control. When you sleep, your brain literally recharges, removing toxic proteins that accumulate during the day as byproducts of normal neuronal activity. This ensures

that you wake up alert and clear-headed. Your energy, attention, and memory are all reduced when you don't get enough quality sleep. Sleep deprivation also raises stress hormone levels on its own, even without a stressor present. Happy people make sleep a priority, because it makes them feel great and they know how lousy they feel when they're sleep deprived.

4 | Live in the moment. You can't reach your full potential until you learn to live your life in the present. No amount of guilt can change the past, and no amount of anxiety can change the future. It's impossible to be happy if you're constantly somewhere else, unable to fully embrace the reality (good or bad) of this very moment. To help yourself live in the moment, you must do two things: First, accept your past. If you don't make peace with your past, it will never leave you and, in doing so, it will create your future. Second, accept the uncertainty of the future. Worry has no place in the here and now. As Mark Twain once said, "Worrying is like paying a debt you don't owe."

5| Learn to love yourself. Most of us have no problem marveling at our friends' good qualities, but it can be hard to appreciate our own. Learn to accept who you are, and appreciate your strengths. Studies have shown that practicing self-compassion increases the number of healthy choices you make, improves mental health, and decreases your tendency to procrastinate.

6| Appreciate what you have. Taking time to contemplate what you're grateful for isn't merely the "right" thing to do. It also improves your mood, because it reduces the stress hormone cortisol by 23 percent. Research conducted at the University of California, Davis found that people who worked daily to cultivate an attitude of gratitude experienced improved mood, energy and physical well-being. It's likely that lower levels of cortisol played a major role in this.

7| Exercise. Getting your body moving for as little as 10 minutes releases GABA, a neurotransmitter that makes your brain feel soothed and keeps you in control of your impulses. Happy people schedule regular exercise and follow through on it because they know it pays huge dividends for their mood.

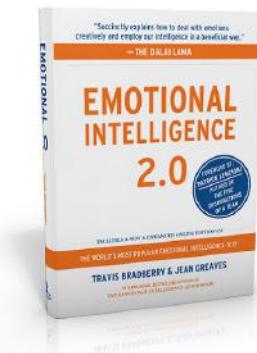
8| Forgive, but don't forget. Happy people live by the motto "Fool me once, shame on you; fool me twice, shame on me." They forgive in order to prevent a grudge, but they never forget. The negative emotions that come with holding onto a grudge are actually a stress response. Holding on to that stress can have devastating consequences for your health and mood, and happy people know to avoid this at all costs. However, offering forgiveness doesn't mean they'll give a wrongdoer another chance. Happy people will not be bogged

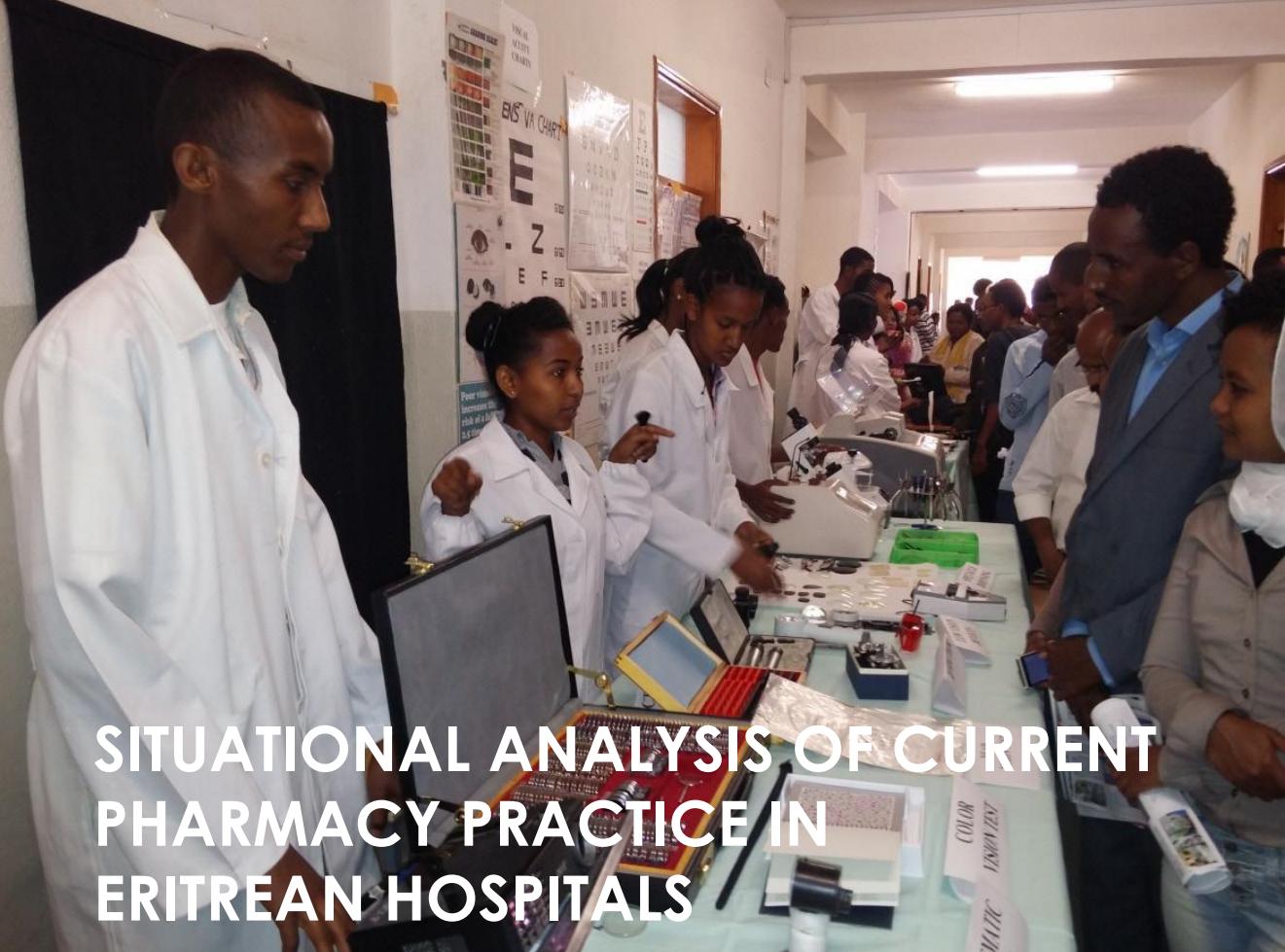
down by mistreatment from others, so they quickly let things go and are assertive in protecting themselves from future harm.

9| Get in touch with your feelings. Attempting to repress your emotions doesn't just feel bad; it's bad for you. Learning to be open about your feelings decreases stress levels and improves your mood. One study even suggested that there was a relationship between how long you live and your ability to express your emotions. It found that people who lived to be at least 100 were significantly more emotionally expressive than the average person.

10| Concentrate on what you can control. Rather than dwelling on the things you can't control, try putting your effort into the things that you can. Have a long commute to work? Try listening to audiobooks. Hurt your leg jogging? Try swimming. More often than not, we take the bad and let it hold us back when it doesn't have to. Happy people are happy because they take their failures in stride, not because they don't fail.

11| Have a growth mindset. People's core attitudes fall into one of two categories: a fixed mindset or a growth mindset. With a fixed mindset, you believe you are who you are and you cannot change. This creates problems when you're challenged, because anything that appears to be more than you can handle is bound to make





SITUATIONAL ANALYSIS OF CURRENT PHARMACY PRACTICE IN ERITREAN HOSPITALS

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ABSTRACT

A pharmacist is an expert in medicines and their use. Hospital pharmacists work to insure that patients get the maximum benefit from their medicines. However, pharmacists in our country are underutilized. This paper presents the discussions and insights, obtained from a panel of experts each working in hospitals throughout the nation. Also, the results drawn upon SWOT analysis alongside proper recommendations, fit with the setting in which

hospital pharmacists are currently engaged in, is discussed.

KEY WORDS: Hospital Pharmacy, SWOT Analysis, Pharmacists

INTRODUCTION

Hospital pharmacy is one of the major sectors where the majority of the pharmacists in the country are actively fulfilling their professional duties. The extent to which their professional skill is exploited is, however, very unsatisfactory and the setting in

which they are currently operating needs attention. A panel discussion was conducted by a group of pharmacists who are currently working as hospital pharmacists in national and zonal referral hospitals. This paper presents the situational analysis of pharmacy practice in hospitals based on the information and insight obtained from the panel discussion and attempts to present the findings in a framework of SWOT (strength, weakness, opportunities and threat) analysis.

A pharmacist is an expert in medicines and their use. Hospital pharmacists work to insure that patients get the maximum benefit from their medicines. They advise medical and nursing staff on the selection and appropriate use of medicines to ensure optimal treatment. Hospital pharmacists work closely with medical and nursing staff on the wards to ensure that patients receive the most appropriate treatments, and provide help and advice to patients in all aspects of their medicines use. They advise on the selection of medicines as well as the dose and route of administration for individual patients, and many are qualified to prescribe in their own right. They can provide information about potential side effects and ensure that new medicines are compatible with any existing medication. In addition they will often monitor the effects of treatment to ensure that it is safe and effective to be used by out-patient departments (OPDs) and inpatient departments (IPDs). Pharmacists are able to undertake additional training in order to allow them to prescribe medicines for specific conditions. Hospital pharmacists are also responsible for the purchase, manufacture, dispensing, quality testing and supply of all medicines used in the hospital, although many of these activities are undertaken by other members of the pharmacy team within the ministry bodies.

THE SCOPE OF PRACTICE OF THE HOSPITAL PHARMACIST

Even though a pharmacist's actual job descriptions do vary from country to country and from setting to setting within the same

country, here is a brief list of what a hospital pharmacist's role can generally encompass. Hospital pharmacists are mainly involved in; (1)

- > Checking prescriptions to ensure that there are no errors and that they are appropriate and safe for the individual patient.
- > Providing advice on the dosage of medicines and the most appropriate form of medication, for example, tablet, injection, ointment or inhaler.
- > Participating in ward rounds, taking patient drug histories and involvement in decision making on appropriate treatments.
- > Liaising with other medical stuff on problems patients may experience when taking their medicines.
- > Discussing treatments with patients, relatives, community pharmacists and GPs.
- > Ensuring medicines are stored appropriately and securely.
- > Supervising the work of less experienced and less qualified staff.
- > Answering questions about medicines from within the hospital, other hospitals and the general public.
- > Keeping up-to-date and contributing to research and development.
- > Writing guidelines for drug use within the hospital and implementing hospital regulations.
- > Providing information on expenditure on drugs.
- > Preparing and quality checking sterile medications, for example intravenous medications.
- > Setting up and supervising clinical trials.

More experienced pharmacists may be involved in teaching both within the pharmacy department and in other areas of the hospital.

CURRENT HOSPITAL PHARMACY PRACTICE IN ERITREA

The current pharmacy practice in Eritrea is mainly confined to store keeping and the interpretation and dispensing of medicines prescribed by physicians or nurses. The pharmacist's involvement in direct patient care is for the most part nil. Even in hospitals where satellite pharmacies are functional, apart from distributing medicines and medical equipment the pharmacist has no recognized power to refuse prescriptions he feels uncertain of*. Even though the challenges that pharmacists face in Eritrea are many in number they can be categorizing as either arising from systemic problems or from the pharmacists individual incompetence or lack of readiness to expand his/her role. The systemic problems may include lack of precisely defined job description for the pharmacist and the absence of suitable platform in the hospital setting where his/her professional role is recognized and enforced by regulatory authorities. A brief list of the challenges faced by the hospital pharmacist is presented hereafter followed by detailed SWOT analysis.

A few of the challenges faced by hospital pharmacists may include the following;

- > Inadequate dispensing area and time.
- > Lack of pharmacist-prescriber communication.
- > Lack of pharmacist-patient communication.
- > Unavailability of updated reference materials and training on the field of practice.
- > Less emphasis is given to the pharmacist's supervisory role over other less experienced and less qualified staff. For ex-

ample, in some settings it is not uncommon to find a pharmacist supervised by a pharmacy technician or even a clerk.

SWOT ANALYSIS

Apart from discussing the current hospital pharmacy practice in Eritrea, the panel has tried to identify strengths, weaknesses, opportunities and threats posed by the existing practice in hospital pharmacies and use these parameters to draw a proposal for change. (Explain SWOT).

Strength

The most notable strength of the hospital pharmacist is his/her educational background which equips him/her with good knowledge to undertake responsibilities properly. Even though, differences between individuals make it seem unrealistic to conclude that all hospital pharmacists are highly qualified, the panel, nonetheless, recognized the existing capacity of practicing hospital pharmacists as a strength not yet exploited. The existence of the Eritrean National List of Medicines (ENLM) is another impetus for hospital pharmacy practice. The ENLM, which is reviewed on a regular basis, allows the pharmacist to work on a limited number of medicines for effective management and rational use of drugs. Adhering to a definite list of medicines makes it easier for the pharmacist to procure, store, distribute and advise health professionals regarding rational use of medicines. In addition, the panel saw the increasing influx of pharmacists to the ministries workforce as strength on itself.

Weaknesses

The panel identified a number of weaknesses evident in the existing hospital pharmacy practice. As stated below, the preliminary list of the weaknesses identified by the panel, it should be noted that the weaknesses include but may not necessarily be limited

to those identified during the discussion.

- Insufficient dispensing area and time.
- Inappropriately written prescriptions with too few information regarding the patients' medical condition for the pharmacist to intervene and give advice to patients.
- Less emphasis given to the supervisory role of the pharmacist over less qualified professionals such as pharmacy technicians and clerks.
- Low rated pharmacist physician interaction.
- Weak pharmacist-patient interaction.
- Weak management of pharmaceuticals.
- Weak mechanism and consumption assessment protocols. In most hospitals consumption pattern is dictated by the demand form submitted by hospital departments with little information being acquired on whether medicines are being used wisely.
- Very often medicines not listed in the ENLM are prescribed by prescribers within the hospital (e.g. rowatinex).
- Absence of drug information units in hospitals.
- Shortage of adequate and updated reference materials.
- Almost all pharmacists working in hospitals have no access to the internet in their working places.

Opportunities

- Influx of newly graduated pharmacists to the ministries workforce.
- The existence of hospital medicine and therapeutic committees in most hospitals which provides the pharmacist with ample opportunities to exercise his professional role in decision matters.
- The existence of alternative medications in the ENLM which grants the pharmacist an advisory role on the best alternative drug for the patient in terms of safety ef-

ficacy or even cost effectiveness.

- A generally receptive environment for the expansion of the pharmacists' role where there is no threat of overlapping job descriptions.
- Hospital pharmacies are generally well staffed compared to other sectors where the pharmacist's presence might be viable.
- The eagerness of hospital pharmacists to expand their role.

Threats

- Both the communities and other health professionals' underestimation of the pharmacist and his capabilities.
- The time it takes to effect behavioral change in the practicing pharmacists as well as other health professionals

RATING THE LEVEL OF PRACTICE

One of the goals of the panel discussion was to reflect on the existing practice in hospital pharmacies and rate it in terms of what the proper practice should have been. The evaluation was made by considering the challenges that are unavoidable and those that can be circumvented. With proper utilization of existing human resources, many of the challenges faced by hospital pharmacists are arguably avoidable. In this respect the panel rated the current practice as unsatisfactory. The panel came to the consensus that the reason for the existing low performance of hospital pharmacy is not because the challenges are insurmountable but because the issue has not been seriously taken by responsible agents.

FUTURE CHALLENGES AND OPPORTUNITIES

In Eritrea pharmacy practice in general and hospital pharmacy in particular is in its developmental stage. The increasing number of pharmacists enrolled in hospitals was regarded by the panel as one of the greatest assets for the implementation of change. Much reform, nonetheless, remains to be

done in order for the profession to realize its actual potentials. In hospital pharmacies the healthcare system may require restructuring so that the pharmacist's contribution is enhanced. However, reform is not an overnight process and requires dedication from both the practicing pharmacists and regulatory agents. Apart from this, there needs a lot to be done to bring about behavioral change in all other health professionals and guarantee their preparedness to embrace the pharmacists 'new' roles.

CONCLUSION AND RECOMMENDATION

The panel in conclusion came to draw a list of recommendations for change. The expansion of the roles of the hospital pharmacist must utilize two different but complementary approaches. The first is a top-down approach. Here, the regulatory authorities must first be convinced of the urgency of the issue in order to draft job descriptions for the hospital pharmacist and assume the responsibility to enforce them. Unless the structure is first set by regulatory forces at the top, the pharmacist's individual effort to expand his role may prove to be fruitless. Therefore, the health system should recognize the pharmacists' actual responsibilities in the hospital create the needed platform and assure that change comes with the least possible challenges to the pharmacist. However, this doesn't mean that the pharmacist stays passive in the whole process. His/her active involvement in hospital area is a critical input without which change is impossible. This is the bottom-up approach complementing the top-down approach the hospital pharmacist promoting his profession in the hospital. Some of the recommendations made by the panel are listed below

- Means for improving dispensing area and time in hospitals should be introduced.
- More emphasis should be given to the

supervisory role of the pharmacist over less qualified professionals such as pharmacy technicians and clerks.

- The pharmacist physician interaction should be strengthened.
- Measures to strengthen the pharmacist-patient interaction should be taken.
- More stringent mechanisms or protocols for consumption assessment should be introduced.
- Adherence to the ENLM should be promoted
- Initiatives should start to be taken for the establishment of drug information units in hospitals.
- Hospital pharmacies should be supplied with adequate and updated reference materials including access to the internet

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