Translation and Analysis of Sample Texts for the Language Pair English-Croatian

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TRANSLATION AND ANALYSIS OF SAMPLE TEXTS FOR THE LANGUAGE PAIR ENGLISH – CROATIAN

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ABSTRACT

The focus of this thesis is to translate and analyze four texts of different genres. Two texts will be translated from Croatian into English, and the other two from English into Croatian. The first and second texts are articles from National Geographic. The first one is about Notre Dame, more specifically, about its history and restorations, past and current. The second one is about the Earth's past, current, and future oceans. The third text is a travel brochure which consists of an itinerary and other important information about the described trip. The fourth text is an interview about the career of a Croatian doctor. Each of the four texts is preceded by a brief introduction and followed by commentary and analysis. The aim of the analysis is to list the problems which were encountered during the process of translation, to discuss them and to provide appropriate solutions to said problems. Each text differs in terms of topic and style.

Key words: translation, Croatian into English, English into Croatian, analysis, problems

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1. INTRODUCTION

This thesis focuses on describing the process of translating four texts that differ in terms of their formality, topic, and style. Two texts will be translated from English into Croatian, and two from Croatian into English. According to Hlavac and Veselica Majhut (9), the volume of translation from English into Croatian and vice-versa has grown significantly over the last 30 years. One of the reasons for this is the fact that Croatia joined the EU in 2013. Another reason why the volume of translation has increased is because of the growing number of foreign language university departments that offer translation specialization.

Several translation techniques were used while translating these texts, and, according to Vinay and Darbelnet (31), they can be classified as direct and indirect translation. Borrowing, calque and literal translation are categorized as methods of direct translation. Borrowing includes taking words from the source (SL) language and transferring them directly to the target language (TL). Calque is a type of borrowing where the word from the source language is translated literally, word for word, into the target language. Lastly, literal translation is a word for word translation, most common for languages of the same family. These translation techniques are used when the structural and conceptual elements of the source language can be shifted into the target language. In other words, we use these methods when we can translate each element, from the source language into the target language, word for word. They are also used when an element is kept in its original form, and not translated because it is assumed that the target language speakers understand the term in the source language. On the other hand, when the structural and conceptual elements of the source language cannot be shifted into the target language, because the meaning or the grammatical elements will have to be altered, indirect translation techniques are used. There are four indirect translation procedures: transposition, modulation, equivalence or idiomatic translation, and adaptation. Transposition includes changing one part of speech for another, e.g., a noun for a verb. Modulation changes the meaning and point of view of the source language, which means that we can use a phrase that is different in the source and target language to convey the same idea. Equivalence is most commonly used to translate idioms or proverbs which do not have direct equivalents in other languages. Lastly, adaptation is used to change a cultural reference specific to the source language which does not exist in the target language.

Translation has always held an important role in the history of humankind. It has helped us to communicate, and its importance has become even more evident in recent years, especially after

world trade has grown. According to Munday (8) *"The process of translation between two different written languages involves the changing of an original written text (the source text or ST) in the original verbal language (the source language or SL) into a written text (the target text or TT) in a different verbal language (the target language or TL)."* It is important that the translation renders the message successfully, i.e., that the source text is successfully translated to the targeted text and understood by the targeted audience. In order to achieve this, the translator must possess great knowledge of both the source and the target text, as well as their cultures, which are of significant importance in every language.

This thesis aims to display, discuss and provide solutions to the problems encountered during the process of translation. The texts were translated using online dictionaries such as *Glosbe* and *Merriam-Webster Dictionary*. Other than using online dictionaries, some terms had to be looked up in other online sources or texts with similar and specialized terminology.

In order to analyze each text, I will be writing a translation brief. This method consists of 12 points of analysis. They are: genre, source, audience, purpose of writing, authenticity, style, level of formality, layout, content, cohesion, sentence patterns, and terminology of the subject. This is important to do because it helps to understand the purpose of the text (i.e., the skopos) and to translate it as accurately as possible. According to Reiss and Vermeer (90), the skopos rule is the highest rule of a theory of translational action: any action is determined by its purpose, i.e. it is a function of its purpose. The purpose determines what is done and how it is done. For example, we cannot set a skopos unless we know the target audience. If we do not know the target audience, we can not decide whether a function makes sense for them.

I have decided to translate two texts from Croatian into English and two texts from English into Croatian, as I expect that, as a translator, I will be commissioned to translate in both directions. While translating into English would be a good linguistic exercise for a student of English, tackling a source text in English and rendering it into a target text in Croatian can be considered a good translation exercise.

This thesis is comprised of an abstract, a table of contents, an introduction, the translation of four texts, each preceded by a short introduction and an analysis and commentary section, which is followed by a conclusion, appendices, and bibliography.

2. TRANSLATION OF THE SOURCE TEXT 1

2.1. Introduction

This text is an article from National Geographic. The topic of the text is the famous Parisian cathedral Notre Dame, and particularly its restauration after the devastating fire in April 2019. The text also mentions the history of Notre Dame, including its builders and former restorers. But the emphasis is on the current restauration and the night that the fire occurred. The text is written in a semi-formal style, and it includes many terms from architecture and art history, but it also includes plenty of idiomatic expressions, phrases and proverbs. Surprisingly, it is because of the aforementioned reason that I have found this text the most demanding out of all, as I have had to resort to indirect translation techniques most of the time.

Translation brief:

1. Genre: online magazine article, news report; architecture, history

2. Source: National Geographic Magazine (Online), published on January 18, 2022 , written by Robert Kunzig

3. Audience: The text is written for a wide audience, anyone who is interested in history, architecture, and things which are happening in the world, in this case, it was the burning of the Notre Dame Cathedral in Paris.

4. Purpose of writing: The purpose of this text is to inform the reader of the events that occurred on the night the Notre Dame was burning, as well as to inform the reader of the history of Notre Dame, what it means to the French people, and the restauration process of the Cathedral.

5. Authenticity: original article by National Geographic

6. Style: online magazine article, news report, informative

7. Level of formality: formal

8. Layout: The article is written in first person from the reporter's view. It is written in many short paragraphs.

9. Content: The writer switches from talking about the history of the cathedral, to the night of the fire, the restorations, the builders of the Cathedral, the interview with the French president etc.

10. Cohesion: Lexical cohesion is achieved by using terms from architecture and art history

11. Sentence patterns: Longer sentences are more common, past tenses are used more often than present tenses.

12: Terminology of the subject: The terminology of the text is diverse. The author uses terms from architecture and art history when describing the building and restauration process, but when talking about the night of the fire, the importance of the Cathedral to the French etc, he uses idioms and phrases.

2.2. Translation

NOTRE DAME SE PONOVO UZDIŽE

Tri godine nakon razarajućeg požara, u obnovi legendarne pariške katedrale oslikavaju se njeni srednjovjekovni korijeni te odaje počast oklevetanom arhitektu koji je crkvu spasio 1800-tih godina.

Požar iz 1831. godine poštedio je samu katedralu Notre Dame. Pobunjenici su se popeli na krov i srušili ogromni željezni križ; razbili vitraj, nasrnuli sjekirama na kip Isusa te razbili kip Djevice Marije. Ali zapravo su se okomili na nadbiskupa koji nije bio tamo – pa su opustošili njegovu palaču koja se nalazila južno od crkve, okrenuta prema rijeci Seni. Zapalili su ju. Palače više nema. Sada na tome mjestu stoji građevinska dizalica visoka gotovo 80 metara.

Postoji crtež scene koja se odvila te noći, 14. veljače 1831., gledan iz perspektive preko puta rijeke Sene, s Quai de Montebella. Nacrtao ga je Eugene-Emmanuel Viollet-le-Duc – čovjek koji će 13 godina kasnije preuzeti restauraciju katedrale u trajanju od 20 godina. Viollet-le-Duc imao je samo 17 godina kada je svjedočio pobunjeničkom napadu taj pobunjenički napad. U njegovom užurbanom crtežu olovkom, nemirne figure nagomilane su u palači, bacajući namještaj i ostale vrijedne stvari kroz prozore u rijeku, a u pozadini stoji Notre Dame, tada stara 6 stoljeća.

Godine 1980. još jedan 17-godišnjak - Phillipe Villeneuve prisustvovao je izložbi o Viollet-le-Duc-u u Grand Palais-u. Znao je da želi biti arhitekt – već je gradio razrađeni model Notre Dame – ali nije znao da se može opredijeliti za povijesne građevine. Danas je jedan od 35 'glavnih arhitekata povijesnih spomenika' u Francuskoj, zanimanje po kojem je i Viollet-le-Duc poznat. Villeneuve vodi radove restauracije na katedrali Notre Dame od 2013. godine, a

povećanom brzinom od proljeća 2019. godine, kada je požar razorio toranj katedrale. Građevina je napokon stabilizirana; rekonstrukcija bi trebala početi. Villeneuve na više načina duguje ovu misiju, borbu svog profesionalnog života, svom genijalnom predvodniku, Viollet-le-Duc – u.

'On je izumio restauraciju povijesnih građevina,' rekao je Villeneuve. 'To se nije radilo prije. Prije su se građevine popravljali u stilu toga doba', ili se nisu popravljale, već su samo srušene.

U 19. stoljeću u Francuskoj, vlada bi prvo osnovala institucije koje bi se sustavno bavile pitanjem koje se tiče svih nas: Koji dio povijesti je dovoljno vrijedan očuvanja i napretka? Što dugujemo tvorevinama naših predaka, koja snaga i stabilnost se uzdižu njihovom prisutnošću – te kada, u suprotnom, postaju teret i sprječavaju nas da se okrenemo budućnosti i stvorimo vlastiti svijet? S ovim se pitanjem susreću svi, u svemiru, u poslu kao i u životu. Svatko od nas ima 'service des monuments historiques' [1]u glavi te nam je teško odlučiti što trebamo zadržati, a čega se trebamo riješiti, kojim promjenama se trebamo oduprijeti, a koje trebamo prihvatiti. Samo što toga često nismo svjesni. Također nismo svjesni koliko možemo utjecati na vladine odluke očuvanja određenih građevina – te kako smo povezani s tim građevinama. Dok im nešto ne zaprijeti.

Notre Dame je u svoje vrijeme bila revolucionarna. Sagrađena je krajem 12. i 13. stoljeća, kada je Francuska postajala država te kada je njezin glavni grad Pariz bio najveći grad u Europi. Notre Dame je bila prvo remek-djelo nove vrste francuske arhitekture u kojoj su šiljaste arkade i lebdeći lukovi omogućavali zidovima da budu visoki i tanki, prozorima da budu prostrani te svjetlosti da prodre u prostor. Ljubomorni Talijani taj su stil nazvali 'gotičkim', misleći pri tome na nešto 'barbarsko', ali ovaj francuski stil je pokorio Europu. Ljudi su osjećali Božju prisutnost u visinama ovih 'gotičkih' građevina.

Doduše, do početka 19. stoljeća, Notre Dame je bila u lošem stanju. Desetljeća napadanja i zapostavljanja koja su počela i prije revolucije 1789. godine znatno su je razorila. Victor Hugo je bio toliko bijesan da je napisao roman koji se temeljio na katedrali, stvarajući polemiku o zlostavljanju povijesti u senzaciju o očajnom?? svećeniku, grbavom zvonaru te o djevojci koju su obojica voljeli. Notre-Dame de Paris objavljena je 1831. godine, mjesec dana nakon što je nadbiskupova palača spaljena. Diljem Francuske, počela je pljačka kamenja iz i oko starih crkvi koje su opkoljene tijekom revolucije,. Hugo je pomogao u osnivanju pokreta čija je poruka bila

[1] ‚un moment historique' is a French phrase which, according to Collins Dictionary, means 'a historic building' or 'a building of historical interest', so the phrase roughly means 'a service to historical buildings'

– dosta je! Viollet-le-Duc je zdušno je prihvatio pokret te je zaslužan za spašavanje Notre Dame. Ponovo je izgradio lukove i vitraje, zamijenio je kipove koje su revolucionari razorili te ih dodao još. Voljeni kipovi koji krase katedralu su njegovo djelo. Kada je sagradio novi drveni toranj, 15 metara viši od srednjovjekovnoga, na stubištu koje vodi do tornja je postavio velike bakrene kipove 12 apostola. Od svih 12 kipova, 11 je bilo okrenuto prema van tako da bdiju nad gradom, , dok je 12. apostol bio sv. Toma, ili onaj koji je sumnjao. Viollet-le-Duc je kipu sv. Tome isklesao svoje lice te ga postavio tako da gleda u njegovo remek-djelo, toranj katedrale. Bio je nevjernik koji je spasio kraljicu francuskih katedrala.

Sada je toj crkvi, koja je mjesto štovanja već više od 800 godina, ponovno potrebna pomoć. Pomoć joj se pruža gotovo pola stoljeća nakon urušavanja katolicizma u Francuskoj, dok se broj turista znatno povećava. Ispred radnog stola u Villeneuve-ovom uredu, koji je smješten iza katedrale, na drugom katu sačinjenom od redova modularnih kontejnera, nalazi se kopija Viollet-le-Duc –ova crteža iz 1843. godine, na kojemu je nacrtana zapadna strana Notre Dame. U kutu okvira te slike uglavljena je kapljica stvrdnutog olova s krova, koji se otopio u požaru 2019. godine. Od same noći požara, Villeneuve-ova je namjera obnoviti crkvu točno onako kako ju je Viollet-le-Duc ostavio, uključujući olovni krov i 'šumu' masivnih greda hrasta koje su podupirale crkvu.

'Restauriramo rad restauratora', rekao je.

Dok je Villeneuve žurio u Pariz iz svog doma na obali Atlantskog oceana, malo prije sedam sati uvečer 15. travnja 2019. godine, da bi sustigao zadnji brzi vlak, ja sam sjedio u taksiju, prelazeći rijeku Senu. Promet je bio užasno spor. Moja žena je pogledala kroz prozor. 'Je li to Notre Dame gori?, pitala je. Trepereća narančasta mrlja na krovu katedrale nije bila objašnjiva. Siguran sam da će uskoro ugasiti požar, promrmljao sam. Nekoliko trenutaka kasnije, vidjeli smo kako se plamen razbuktao te progutao drveni toranj katedrale.

Svi u Francuskoj se sjećaju gdje su bili te travanjske noći kada je Notre Dame gorila – iako nitko nije izgubio život, ovaj događaj na neki način možemo usporediti s napadom na blizance 11. rujna 2001. Bernard Hermann, umirovljeni fotograf, bio je u svojem potkrovlju koje se nalazi pored Place du Petit Pont te koje je okrenuto prema katedrali. Njegova knjiga Paris, km 00, koja nosi taj naziv zbog toga što je Notre Dame početna točka mjere na kartama u Francuskoj, sastoji se od fotografija snimljenih s njegovog prozora. 'Drama vezana uz Notre Dame je za mene značila smak svijeta', rekao je Hermann. 'Bio sam zapanjen. Navukao sam zavjese.

Povjesničar umjetnosti Jean-Michael Leniaud nalazio se na recepciji palače Versailles. Pojurio je u Pariz i promatrao dramu. 'Ljudi su plakali. Molili se. Klečali na ulici,' rekao je.

Otprilike 4 kilometra zapadnije, Faycal Ait Said, koji upravlja dizalicom koja se trenutno uzdiže nad oštećenom katedralom, tada je sudjelovao u gradnji novog nebodera za poslovne prostore na još višoj dizalici, završavajući smjenu. Stojeći sam na 130 metara visine, ugledao je ogromni oblak dima koji se polako počeo kretati prema zapadu.

Dok je konzervatorica ministarstva kulture odgovorna za Notre Dame, Marie-Helene Didier, prošla kroz ograđeno područje, većinu dragocjenih artefakta su već bila izvukli i premjestili u dvorište katedrale. 'Izgledalo je kao veliki buvljak,' rekla je. Kasnije te večeri većina artefakta u kombiju je prevezena u Hotel de Ville, u pratnji Didier. Na njezinom krilu bila je položena lanena tunika St. Luja, kralja i križara iz 13. stoljeća. Njezin šef, koji je držao Trnovu krunu, sjedio je pored nje. Predsjednik Emmanuel Macron bio je u Elizejskoj palači, gdje se obraćao naciji snimajući večernju televizijsku izjavu u kojoj je odgovorio 'žutim prslucima' –pokretu protiv njegove vlade. Odgodio je davanje izjave i pojurio prema katedrali. Notre Dame je 'naša povijest, naša književnost, naša mašta….epicentar našega života,' rekao je, obraćajući se televizijskim kamerama. 'Obnoviti ćemo ovu katedralu, svi zajedno.'

'Dorothe Chaoui-Derieux, konzervatorica koja nadgleda arheološka iskopavanja U Parizu, pročitala je vijest na Twitter-u dok je pripremala večeru za svoje troje djece. Shvatila je da ih nikada nije odvela u Notre Dame. Tada joj još nije palo na pamet da će naredne dvije gotovo svaki dan provoditi u praznoj katedrali, pregledavajući ruševine – koje naziva ostacima – da će sama Notre Dame postati arheološko nalazište.

Dok je crkva još gorila, televizijske mreže objavljivale su izjave: 'Bio sam glup i sjedio pred televizorom, iako živim u Parizu i trebao sam biti na licu mjesta', rekao je šumarski stručnjak, Phillip Gourmain. Postajući sve bjesniji, čuo je kako stručnjaci smatraju da se drveni okvir tavana Notre Dame-a nikada neće obnoviti budući da Francuska ne posjeduje hrastove i vještine potrebne za obnovu. Gourmain nadgleda šume diljem Francuske. Već u 11 sati ujutro je vodio telefonski razgovor s prijateljem iz Državnog Zavoda za Šumarstvo, smišljajući plan kako prikupiti drvo potrebno za obnovu putem donacija.

Otprilike u isto vrijeme, Villeneuve je stigao u parvis[2], trg ispred katedrale. Putovao je vlakom te bio izvan dosega mreže kada se toranj koji je sagradio Viollet-le-Duc srušio. Idućeg dana,

[2] According to Merriam-Webster Dictionary, 'parvis' is 'a single portico or colonnade before a church'

penjući se sjevernim tornjem kako bi ispitao štetu, uočio je bakrenog pijetla koji je stajao na samom vrhu tornja. Slobodnim padom dospio je na bočni krov. U novinama Le Parisien osvanula je slika ovog mladog arhitekta na kojoj čvrsto drži zgnječenu pticu u rukama.

'Kada sam stigao u parvis, bio sam mrtav. Sada sam u komi,' rekao mi je. 'Obnavljajući katedralu, obnavljam sebe. Osjećat ću se bolje tek kada dovršim posao.' U rujnu, kada je obnova katedrale uskoro trebala započeti, Villeneuve je na lijevoj ruci, od lakta do zapešća, tetovirao crtež tornja.

Tijekom ljeta 1998. godine, Stephen Murray, povjesničar umjetnosti sa Sveučilišta Columbia odveo me na tavan Notre Dame-a. Iako je vani bio sunčan dan, unutra je bilo tmurno. Dok smo hodali mrežom grubo sječenih hrastovih greda, zakrivljeni vrhovi uzdignutog vapnenačkog svoda širili su se poput sivih slonovih leđa ispod naših nogu. Prašina se skupljala u šupljinama. Kada bih stajao dolje, u unutrašnjosti crkve, nikad nisam zamišljao ovaj svijet iza kulisa – svijet graditelja katedrale. Na križanju transepta i broda, digao sam pogled i promatrao zamršeni drveni k tornja katedrale.

Prošlog ljeta sam ponovo stajao na istome mjestu. No, ovog puta sam stajao na skeli, gledajući dolje u ogromnu rupu koju je toranj katedrale napravio kada se srušio kroz kameni svod. Sami vrh tornja je napravio još jednu rupu u brodu. Treća je nastala na sjevernom kraju transepta. Dok je plamen divljao, trokutne grede hrasta visoke 10 metara su se rušile na svod poput domino pločica, a krhotine su padale kroz rupe. Pougljeno drvo i kamenje su padali na pod katedrale te se stvorila hrpa visine veće od jednog metra.

Nekoliko dana nakon požara, dok je Macron obećavao da će se Notre Dame ponovo otvoriti do ljetnih Olimpijskih Igara u Parizu 2024. godine, Chaoui-Derieux i njezini kolege odlučili su da ruševine ne mogu samo tako biti odnesene. One su materijal zakonski zaštićene kulturne baštine te bi ih trebali razvrstati stručnjaci. Desetina stručnjaka ubrzo je stigla u crkvu. Istraživački Laboratorij za Povijesne Znamenitosti uskoro je poslao veliki dio svog tima od 34 zaposlenika, rekao mi je zamjenik direktora Theirry Zimmer.

Budući da je još uvijek postojala opasnost da se oštećeni svod uruši, znanstvenici su koristili daljinski upravljive robote upravljač kako bi sakupili ostatke ruševina. Noseći respiratore kako bi se zaštitili od olovne prašine, razvrstali su krhotine po strani, razabirući ono što bi moglo biti od značaja za obnovu ili od povijesnog značaja. Na primjer, tri prstena u većim komadima drva su značajni za detaljan slijed gradnje crkve.

'Sve ono čega što nismo mogli dokučiti ranije', rekao je Zimmer, 'sada nam je nažalost dospjelo u ruke.' Pozitivna strana svega toga je to što ćemo proširiti znanje o katedrali i o vremenskom razdoblju kada je sagrađena.

Trebalo im je dvije godine da razvrstaju sve krhotine te da ih odnesu u skladište u blizini zračne luke Charles De Gaulle. Krhotine zauzimaju gotovo 25000 m2 te su smještene na policama visine od 6 metara. Sačuvani su čak komadići drva koji su presitni za proučavanje, kao i maleni komadići kamenja te prašina i pepeo koji se trenutno nalaze u stotinama vreća za pohranu. Bio je to naporan posao, rekla je Chaoui-Derieux, ali i uzbudljiv, 'ljudska avantura' koju ne očekuje ponovo iskusiti.

Dok je pod Notre Dame-a bio u procesu čišćenja, zidovi i svod su morali biti zaštićeni od urušavanja. Inženjersko vještačenjenje je pokazalo da su zidovi bez potpore olovnog krova i greda koji ih povezuju iznimno osjetljivi na udare vjetra. Nalet vjetra brzine 90 km/h bi ih mogao srušiti. Od 2019. godine do ljeta 2021. godine, tesari su podigli potporne lukove i dio svoda, postavljajući prilagođene više-tonske drvene podupirače ispod svakog luka dok su tehničari u međuvremenu rastavljali stare skele, skidajući jednu po jednu čeličnu cijev. Villeneuve je planirao obnoviti toranj katedrale prije nego je požar izbio. Bio je obješeni, zapetljani kaos kojemu je prijetilo urušavanje i time dodatno oštećenje crkve.

Gradilište se u svibnju 2020. godine zbog pandemije izazvane COVID-om zatvorilo na dva mjeseca. Također je već bilo zatvoreno na 6 tjedana 2019. godine zbog štetne olovne prašine, nakon što su inspektori zaštite na radu odlučili da su prvobitne sigurnosne mjere bile nedovoljne. Od tada, niz tuševa u kontejneru koji služi kao garderoba podijelio je gradilište u prljavi i čisti dio. Radnici svakodnevno pregovaraju o toj granici, skidajući se i presvlačeći u zaštitnu odjeću kako bi mogli krenuti s radom, a zatim rade obrnuto te se tuširaju i peru kosu svaki puta kada napuste prostor gradilišta, čak i tijekom pauze, kada idu na ručak. Posjetitelji moraju slijediti isti postupak. Osigurano je jednokratno donje rublje i kombinezoni.

Čak se i Emmanuel Macron pridržavao ovih pravila. Ovu informaciju znam iz pouzdanih izvora, budući da mi ju je povjerio general s pet zvjezdica, kojeg je sam predsjednik dan nakon požara pozvao iz mirovine te ga zamolio da nadgleda obnovu katedrale.

Jean-Louis Georgelin započeo je karijeru u pješadiji. Bio je glavni vojni savjetnik jednom predsjedniku i predsjedik generalnog stožera za vrijeme vladavine drugog predsjednika. Prema Georgelinu, Macron mu je povjerio Notre Dame iz dva razloga: General je pobožni Katolik, koji zna psalme na latinskom, jednom prilikom mi je čak izrecitirao jedan te ima političku snalažljivost i ovlast ponovo otvoriti katedralu do 2024. godine. Da bi ovo uspjelo, bit će potrebno upravljati Francuskom državnom birokracijom. Georgelin presjeda javnim tijelom koje je uspostavljeno samo zbog obnove Notre Dame te koristi donacije u iznosu od 840 milijuna eura, uključujući 30 milijuna od donatora iz SAD-a.

Projekte obnove u pravilu nadgleda ministarstvo kulture. Pojedinci iz tog miljea smatraju da je uključivanje generala neuobičajeno te da je neostvarivo da se katedrala obnovi do 2024. godine. Je li to stvarno istina? Pitao sam Georgelina. Spremno je izbjegao odgovoriti.

'Vidim da su na Vas, gospodine, utjecali oni koji vjeruju da se predsjednik republike ne bi trebao miješati u obnovu Notre Dame-a', rekao je. 'Na Vas utječe stranka zaostajanja.' Georgelin je dominantna osoba s dobrim smislom za humor, čovjek koji te tijekom razgovora nadglasa svojim jakim basom, obmani satiričnim formalnostima a sve to arogantno se smješkajući.

Šteta na crkvi je značajna ali lokalizirana, rekao je Georgelin. I mene samog je iznenadilo kako se veći dio crkve činio neoštećen, kada bi zanemarili skele koje sada zauzimaju većinu unutrašnjosti. Marie-Helene Didier je također bila iznenađena kada je obišla katedralu dan nakon požara, prelazeći prstom preko zida kako bi provjerila jesu li puni čađe. 'Ništa nije uništeno!', uzviknula je, misleći pritom na dragocjene predmete i umjetnička djela. Novi oltar je zdrobljen, ali čuvena Djevica od Pariza, kameni kip iz 14. stoljeća, još uvijek je stajao nekoliko metara dalje od oltara, pun prašine ali neoštećen, s krhotinama pod nogama. U laboratoriju znamenitosti, stručnjakinja za vitraje Claudie Loisel rekla mi je da je vrh tornja katedrale izbio samo nekoliko komada stakla s tri manje ploče te da su ostali vitraji neoštećeni.

Sve u svemu, crkva je ostala bez toranja, krova i krovne grede te nekoliko kamenih lukova. Znatna šteta, ali to nije ništa što se ne može popraviti do 2024. godine, rekao je Georgelin.

Za razliku od većine ljudi s kojima sam razgovarao, on je prije požara ponekad išao na misu u Notre Dame. General je te užasne večeri bio u svom domu u Parizu, gledajući televiziju i plačući, 'kao i svi ostali.' Čuo je ljude kako govore da nikada neće doživjeti obnovu Notre Dame-a. Upravo zbog toga je predsjednikovo obraćanje naciji predsjednika bilo neophodno, rekao je Georgelin, a što se tiče roka od pet godina, da ga Macron nije postavio, arhitekti i ostali

bi obnovu oduljili na 15 godina. General je zatim uputio pogled prema stropu i bešumno zazviždao kako bi pokazao što znači kada netko gubi vrijeme gledajući u oblake.

'Što se tiče glavnog arhitekta povijesnih znamenitosti…već sam mu puno puta objasnio, i reći ću mu opet…da bi trebao začepiti gubicu.' Ove riječi, koje se odnose na Philippe-a Villeneuve-a, Georgelin uputio je odboru Francuske Narodne Skupštine u studenom 2019. godine.

Ovoj dvojici muškaraca vjerojatno je suđeno da se sukobe. Georgelin je navikao da ga ljudi ne ponižavaju dok obavlja određeni posao. Kao glavni arhitekt, Villeneuve je navikao na veliku slobodu. Georgelin nosi odijela i sakoe na dvostruko kopčanje koji, prema pretpostavkama, ne skrivaju ni jednu tetovažu. Villeneuve je intelektualac koji nosi traperice, zgužvane jakne i naočale poput bakica. Također je emotivna osoba koja ovu krizu shvaća osobno te otvoreno pokazuje emocije. Ima dobar razlog gajiti jake osjećaje prema situaciji u Notre Dame-u.

Nije mu prvi put da se suočava s ovakvom situacijom. 'Karijera mi je obilježena vatrom', rekao mi je. Na dan kad je unaprijeđen u glavnog arhitekta povijesnih znamenitosti 1998. godine, Villeneuve je saznao da je Charente-Maritime, srednjovjekovnu crkvu u njegovom odjelu zapalio udar munje. To mu je bila prva dužnost. Na dan kada je Notre Dame bila u oblacima dima, radio je na drugom važnom projektu, gradskoj vijećnici iz 15. stoljeća La Rochelle, koju je ranije isto razorila vatra dok ju je Villeneuve obnavljao. To se dogodilo 2013. godine, nedugo prije je izabran za obnovu Notre Dame.

Nema dokaza koji povezuju požare sa restauratorskim radovima. Pariška policija nije objavila rezultate istrage iz Notre Dame-a, no sumnja se da je došlo do kratkog spoja na električnim vodovima. No, Villeneuve još uvijek nosi teret te smatra da se mora odužiti za ovu tragediju.

'Dorastao je situaciji', rekao je Jacques Moulin, glavni arhitekt koji obnavlja obližnju baziliku Saint-Denis. 'Uspio je nadvladati samoga sebe. To je rijetkost.' Ali zbog toga je došao u sukob interesa s predsjednikom.

Nakon požara, Macron je javno potaknuo nešto novo za arhitekte, takozvanu 'suvremenu gestu' . 'Trebamo imati povjerenja u današnje graditelje, rekao je, 'te trebamo imati povjerenja sami u sebe.' Graditelji su na ovo odgovorili veselo. Prijedlozi za staklenim krovovima, kristalnim i svjetlećim tornjevima su stizali iz cijelog svijeta. Jedan arhitektonski studio je čak predložio da se na krovu sagradi staklenik. Drugi studio je predložio da se krov zamjeni otvorenim bazenom.

Villeneuve je sve ovo htio sasjeći u korijenu. Rekao je da neće sudjelovati u gradnji modernog tornja. Tada ga je Georgelin pomalo nespretno htio ušutkati. No, svi ovi šašavi prijedlozi išli su

u Villeneuve-u korist. Svi su se složili da katedrala ne bi trebala postati nadzemni bazen. Do ljeta 2020. godine, Villeneuve-ov plan su odobrili general, predsjednik te povjerenstvo za nacionalnu baštinu. Notre Dame će se obnoviti u istom stilu, onako kako je prije izgledala, tj. onako kako ju je ostavio Viollet-le-Duc.

Bila je to pobjeda doktrine: Francuski restauratori obično obnavljaju tako da predmet obnavljanja izgleda isto kao što je prije izgledao. Venecijanska povelja, donesena 1964. godine na međunarodnoj konferenciji stručnjaka, kodificira takav pristup, kojemu cilj povijesne restauracije nije gradnja najljepše građevine, već najautentičnije, tj. one u kojoj će svaki dio povijesti biti očuvan. Iako zvuči kao akademski poticaj, također je i emotivni. Obnoviti na identičan način, pogotovo nakon katastrofe, je 'moćan simbolični čin, kao i katarzični čin', rekao je povjesničar Leniaud. 'Ovako jedino možemo tugovati. Jako je važno tugovati.'

Ironično je da Viollet-le-Duc, koji je gledao kako Notre Dame napadaju, nije pokazao takvu suzdržanost (pogotovo nakon što je nakon smrti partnera Jean-Baptiste-a Lassius-a u potpunosti preuzeo vodstvo). Njegov cilj nije bio obnoviti Notre Dame da izgleda kao prije već izgraditi idealnu katedralu. Dio zida oko križišta je potpuno obnovio zbog toga što mu se nije svidjelo kako je izmijenjen u 13. stoljeću. Srušio je sakristiju iz 18. stoljeća i zamijenio ju neo-gotičkom. Odavao je čast arhitektima gotike tako što je sam pokušao postati jedan od njih, a prema sporazumu, sagradivši toranj nadmašio je samoga sebe. Ipak, dopuštajući si neke druge stvari, napravio je suprotno.

Stoljeće nakon njegove smrti, Viollet-le-Duc je ocrnjen od strane ustanove spomenika koju je pomogao osnovati. 'Kada sam bio još dijete i pohađao školu za arhitekte, uz restauraciju na kojoj je radio Viollet-le-Duc povezivao se veliki nered , rekao je Moulin. Viollet-le-Duc je u Notre Dame-u naslikao ukrasne freske u svih 24 bočnih kapela. Tijekom 1970-ih godina, 12 kapelica (lađe) je ostrugano do golog kamena. No, tada je vraćanje ugleda ovog velikog čovjeka već počinjala te je izložba koju je 17-godišnji Villeneuve vidio 1980. godine postala prekretnicom. 'Viollet-le-duc od zlikovca je postao svecem', rekao je Moulin.

Većina francuskih restauratora se danas ne bi usudila promijeniti nešto što je Viollet-le-Duc napravio. Moulin smatra da je to šteta. On također vjeruje u očuvanje povijesti, ali smatra da, kada se građevina jednom i za sva vremena obnovi na način da da izgleda potpuno isto kao ranije, to je kao da izjavimo da je povijest za tu zgradu završila: 'To je definicija smrti.' Također nije uvijek dobro rješenje za očuvanje. Ako je krov katedrale upravo izgorio, nema smisla ponovo izgraditi krovne grede od drva.

Ovaj argument su u Notre Dame-u čuli te zatim odbili. Svod i toranj će se doista izgraditi od drva, no biti će otporniji na vatru i imat će prigušivače požara. O detaljima se još raspravlja.

Vatra koja je 2019. godine razarala hrastove grede bila je toliko vruća da je vjerojatno dosegla temperaturu veću od 750° te prodrla kroz okolne zidove od vapnenca i kroz gornji dio nekih svodova. Dva stručnjaka za kamen iz laboratorija spomenika, geologinja Lise Cadot-Leroux i znanstvenik konzervator Jean-Didier Mertz su prošli obuku za visinske tehničare kako bi mogli ispitati štetu. Mertz mi je pokazao jezgre dugačke oko 30 centimetara koje su izvukli iz kamenja debljine 60 centimetara. Površina nekoliko kamenja pretvorila se u prah te su se unutar kamena formirali rascjepi što je dovelo do odvajanja oko 10 centimetara kamena. No, čini se da je većina kamenih blokova imala dovoljnu debljinu i čvrstoću, rekao je Mertz. U suradnji s kolegama razvio je tehniku kojom bi zatvorili pukotine ubrizgavajući vapneni mulj u njih. Što se tiče kamenja koje bi trebalo zamijeniti, znanstvenici traže odgovarajuću zamjenu sjeverno od Pariza. Grad se razvio preko srednjovjekovnih kamenoloma, koji su se tada nalazili na periferiji grada.

Veći dio olova s krova i tornja, kojeg je bilo 507 tona, jednostavno se otopio i pao u unutrašnjost crkve, ali toplina je bila dovoljno jaka da ispusti čestice olova u dim. Opasnost od udisanja olova te je večeri bila 'zanemariva', osim ako ste stajali tik uz vatru, rekao je Jerome Langrand, doktor i toksikolog koji vodi pariški centar za toksikologiju u bolnici Lariboisiere-Fernand-Widal. Prava opasnost kod olova se krije u tome da ga tijekom određenog vremena možemo slučajno progutati, a posebice djeca putem zagađene zemlje u parku, na igralištima ili u prašini koja se skuplja u našem domu. Alexander van Geen, znanstvenik sa Sveučilišta u Columbiji koji je hodao Parizom, skupljajući uzorke zemlje u papirnate vrećice, procijenio je da je otprilike jedna tona olova s krova pala u okrugu od jednog kilometra oko crkve.

No, nema dokaza da je ovo olovo uzrokovalo značajno trovanje, rekao je Langrand. Zajedno s kolegama analizirao je uzorke krvi kod 1200 djece iz zahvaćenog područja.

Koncentracija olova dosegla je zabrinjavajuću razinu u otprilike jedan posto ispitanih uzoraka – što je otprilike i prosjek u francuskom stanovništvu (te puno manje nego u SAD – u). Čak štoviše, istraživanje je pokazalo da su djeca svakodnevno bila izložena drugim izvorima olova. Primjerice, mnogi balkoni u Parizu imaju olovne podove.

Ipak, ni najmanja količina olova u krvi nije sigurna, a olovni krovovi onečišćuju okoliš kad god na njima izvodimo radove ili kada god pada kiša. Savjetodavni odbor ministarstva zdravlja, čiji član je Langrand, je u veljači 2021. godine predložio da Francuska zabrani korištenje olova u

novo građenim krovovima te da se prilikom restauriranja starih krovova pronađu zamjenski materijali. Gradsko vijeće Pariza je već tada izglasalo da zahtijevaju da se novi krov Notre Dame-a izgradi bez korištenja olova.

Ništa od navedenoga nije smanjilo Villeneuvu ustrajnost. Da bi ih olovni krov Notre Dame-a ugrozio, djeca bi se morala na isti popeti i lizati ga, uporno tvrde i Villeneuve i Georgelin.

'Olovo je apsolutno neizostavan element u ovoj gradnji,' tvrdi Villeneuve. Naravno, katedrala u Chartres-u ima bakreni krov – no, bakar pozeleni, a Pariški krovovi su sivi. Većina je cinčana, ali samo olovo može tvoriti vrh tornja i isklesane ukrase krova Notre Dame-a. Olovo već pokriva Panteon, Dom invalida u Parizu i druge znamenitosti, tvrdi Villeneuve; zašto bi katedrala bila jedina žrtva 'ludosti olovnih fundamentalista?' Kišnica koja bude padala s novo izgrađenog krova će biti sakupljena i filtrirana.

Villeneuve također namjerava obnoviti drveni okvir tavana točno kakav je bio. Imao je dva jasno izražena dijela. Kada je Viollet-le-Duc obnovio vrh tornja, zamijenio je okvir transepta, ali na način koji nije u skladu sa srednjovjekovnim. Naime, grede su rezane u industrijskoj pilani. Villeneuve će učiniti potpuno isto. Prošle zime, Gourmain je koordinirao donaciju 1200 hrastova iz cijele Francuske. Netom prije francuske revolucije, kraljevski šumari posadili su hrastove koje su čuvali kao zalihu za jarbole mornarice, a najstariji i najveći hrastovi će služiti kao temelj vrha tornja. Ti hrastovi će služiti kao temelj vrha tornja.

Grede broda i kora su bile različite: većina njih je bila izvorna, iz 13. stoljeća. U rujnu 2020. godine, skupina zvana Carpenters Without Borders (Stolari bez granica) rekonstruirala je jedno od trokutastih krovišta koje se nalazi na prednjem dijelu katedrale, kako bi demonstrirala izvedivost obnove okvira na srednjovjekovni način. Francois Calame, etnolog i stolar koji je osnovao grupu, odveo me da vidim to isto krovište koje je sada izloženo ispred srednjovjekovne tvrđave Chateau de Crevecoeur u Normandiji. Sastoji se od desetak greda, a svaka je ručno klesana od istog hrasta, debljine oko 30 centimetara.

Srednjovjekovni stolari obrađivali su sirovo drvo , a isto su učinili i Stolari bez granice. Pratili su srž i linije greda. To je nekim gredama dalo blagu krivulju, no učinilo ih je snažnijima. Krovište Notre Dame-a izdržalo je 800 godina, prije nego ga je sreća napustila.

Calame je iz prtljažnika svog auta izvadio alat vlastitog izbora: veliku/široku sjekiru sa prednjim dijelom nalik trubi (doloire)[3]. Nekoliko puta je snažno zamahnuo sjekirom o deblo te je onda pustio mene da učinim isto. Upozorio me je da je sjekira dovoljno oštra da uzrokuje ozbiljnu ozljedu ako loše naciljamo, a tako se i činilo. Moji prvi udarci sjekirom su se samo odbili o deblo, popraćeni glasnim zvukom, no onda sam ih uspio zadati nekoliko. Tanki klinovi svježeg drveta letjeli su po zraku.

Svrha povijesne restauracije, prema Calame-u, leži u obnavljanju vještine, kao i oštećene građevine – nije bitna samo dobrobit stolara. On misli da razlog zbog kojeg je 'šuma' Notre Dame-a ostavila takav veliki dojam na ljude koji su je vidjeli jest u tome što majstori koji su je izradili već stoljećima ostavljaju poruku iza sebe.

"Drveni okvir je bio star 800 godina. Nema ga više. No, ako ga izgradimo na isti način kao što je bio izgrađen i ako koristimo iste materijale, mislim da poruka može biti prenesena", rekao je Calame. "Moći ćete ju osjeetiti."

Demonstracija Stolara bez granica impresionirala je Villeneuve-a. Kako bi dobili na vremenu, rekao je, pilana će obraditi debla za brod i kor, no grede će biti obrađene do kraja ručno koristeći doloires. No, gradnja vrha tornja će biti u prvom planu. Viollet-le-Duc je morao napraviti rupu u svodu kako bi mogao izgraditi vrh tornja s unutarnje strane. Villeneuve ima prednost: rupa već postoji.

Maurice de Sully, pariški biskup koji je naredio gradnju katedrale 1163. godine, bio je sin seljaka. Dok je vrh tornja sezao prema nebu, Sully je imao svjetske ambicije: Pokazivao je svoju moć protivnicima, kao i kralju. Toranj na nadbiskupskoj palači izgledao je kao bedemi dvorca. Zapadno pročelje katedrale bilo je još veće.

'U srednjem vijeku potpuno je dominirala gradom', rekao je Bernard Fonquernie, glavni arhitekt koji je obnavljao pročelje katedrale tijekom 1990ih godina, odstranjujući ispušne plinove automobila i golublji izmet. Živio sam u Francuskoj tada i sjećam se te obnove – kako su se zidovi sjajili kada je skela maknuta.

Gradnja katedrale je većinom financirana od strane običnih ljudi, rekao je povjesničar umjetnosti Dany Sandrom sa sveučilišta Sorbonne. Oni crkvu nisu doživljavali isto kao i današnji katolici koji idu na mise. Dok su čavrljali u brodu crkve u kojemu nema stolica, jedva

[3] Acccording to yourdicitonary.com, a doloire is: 'A medieval war and utility axe with a long wooden haft of 1.5 metres in length set with a blade shaped as a tear drop.'

su čuli i vidjeli misu koju je kanonik držao osam puta dnevno, iza zida kora. U bočnim kapelicama, kapelani su održavalidravažali do 120 misa na dan, no ni one nisu puno služile živućima: služile su imućnima na samrti, koji su neprestano plaćali mise u nadi da će im duše brzo napustiti čistilište.

Međutim, obični ljudi su se gomilali u Notre Dame-u. Nekada su spavali na podu ispred oltara, sanjajući o čudesnom lijeku za teške bolesti. Katolička vjera tada je bila od velike važnost većini francuza. Danas više nije.

'Notre Dame nije muzej', inzistirao je Patrick Chauvet, župnik katedrale. Prije požara, oko 3000 ljudi je dolazilo na misu nedjeljom – no, 10 do 12 milijuna turista je posjećivalo katedralu svake godine. Većina je imala oskudno znanje o kršćanstvu. 'Kako da na njih utječe svetost ovoga mjesta?', pita Chauvet. 'Kako ih ljepota ovoga mjesta možda može barem ispitati o smislu njihovih života?'

Plan je, kaže, ponovo organizirati posjete. Kada se crkva ponovo otvori, posjetitelje će se na novi način provoditi kroz crkvu, pored rekonstruiranih bočnih kapela. Počevši od sjevera prema jugu – od tame do svjetlosti – prvo će se susresti sa Starim Zavjetom, zatim Novim, ' kako bi postupno razumjeli misteriju samog Boga', rekao je Chauvet.

Hoće li im to uspjeti? Zahvaljujući iznimno velikom budžetu restauracije, katedrala bi u najmanju ruku trebala izgledati sređeno. U planu je da se rad koji bi inače trajao desetljećima odradi za tri godine. Cijela unutrašnjost crkve, uključujući sve kapelice i slike te većinu vitraja će biti očišćeni – svjetlucavo čisto preuređenje. Ako je, prema Georgelinovom mišljenju 'ljepota gotičke arhitekture jedna od najboljih dokaza postojanja Boga', onda će se Bog uzdići kako bi se još jedan dan borio za Francusku. Požar se nije dogodio uzalud.

Moja žena i ja smo te travanjske večeri bili sa starim prijateljima koji su prvi put doputovali u Pariz. Nakon što smo večerali na desnoj obali Sene, odlučili smo se vratiti na lijevu gdje smo i odsjeli. Obale rijeke Sene su bile pune ljudi koji su gledali kako Notre Dame gori. Prelazeći Ile Saint-Louis, prekoračili smo crijevo koje su vatrogasci postavljali kako bi ispumpali vodu iz rijeke. Na mostu Pont de la Tournelle-u, zastali smo pored improviziranog zbora koji je tiho pjevao crkvene pjesme Bogorodici. Divio sam se tom pogledu od Sene prema apsidi Notre Dame-a desetak puta. Ne mogu ni zamisliti kako bi bilo kada bi katedrala zauvijek nestala.

'Bilo je prekrasno – moramo spomenuti ljepotu vatre', rekao je Leniaud. 'Bilo je veličanstveno. No, najprije je lijepo, a zatim je ružno. Ostaju samo ruševine. U početku postoji samo mrak, tama, smrt.' Sve dok se opet ne vrati u život, kao što mora.

2.3. Commentary and analysis

Even though it might not seem like it, this was the most difficult and demanding text out of the four texts that I have translated. It did not contain medical or biological terms like the other ones, so one might think that it cannot be that challenging to translate it. But, this text consisted of numerous idioms, phrases and other casual sayings in English, as well as some French terms, which all had to be translated in a way to convey a similar meaning in Croatian. So, in these cases, literal translation was out of the question. Other than this, the text contained many architectural terms, and terms used by art historians, which, unlike the medical and biological terms, are not that similar in English and Croatian. Also, these terms were slighly more difficult to find in dictionaries because they are not as commonly used as the medical and biological terms are.

The first term from art history that I had translate was ‘stained glass’, which is not literally translated as ‘obojeno staklo’, but as ‘vitraj’.

Throughout the whole text, most measure units are expressed in feet, inches etc. I have decided to convert all these units into the metric system, which is used in Croatia, in order for anyone reading this translation to have a better sense of the size of something mentioned in the text. For example, in the following sentence, feet is used as a measure unit: ‘A 250-foot-tall construction crane stands on that spot.’ I’ve used a metric converter to convert feet into meters: ‘Sada na tome mjestu stoji građevinska dizalica visoka gotovo 80 metara.’

I wasn’t sure how to translate the verb ‘stabilized’, except ‘stabilizirana’. I’ve contemplated on using the words ‘osigurana’, ‘očuvana’, or ‘uravnotežena’. In the end, I decided to use ‘stabilizirana’.

I’ve encountered a French phrase ‘des monuments historiques’ for which I couldn’t find a Croatian nor English equivalent, only an explanation that is means ‘a historic building’ or ‘a building of historical interest’. I could translate this into Croatian, but I’ve decided to leave the French phrase, because it is more authentic.

Further in the text, I've come across more terms from art history and architecture, such as: 'pointed arches' and 'flying buttresses'. In Croatian, they translate as 'šiljaste arkade' and 'lebdeći lukovi'.

The following very short English sentence contained a phrase: 'Viollet-le-Duc was swept up in it.' I decided to connect it with the following sentence 'He saved Noe Dame', and translate it as: 'Viollet-le-Duc zdušno je prihvatio pokret te je zaslužan za spašavanje Notre Dame.'

The words 'wooden spire' are mentioned throughout the whole text', and I've translated them as 'drveni toranj'.

'Larger-than-life' cannot be translated literally, so I've opted for 'velike', meaning 'big' or 'large'.

I wasn't sure how to translate 'historian of architecture', but after reading a short biography about the said man, Jean-Michel Leniaud, he was stated as a historian of art, which is 'povijesničar umjetnosti' in Croatian.

Once again, I've had to convert feet into meters, so 425 feet became 130 meters.

At first, I wanted to translate 'firefighters' perimeter' as 'vatrogasni perimetar' which is quite literally and not quite understandable. Instead, I've opted for 'ograđeno područje' which would mean 'enclosed area'.

The idiom 'offered talking heads' couldn't be translated literally, so I've opted for 'objavljivale su izjave'.

According to the Merriam Webster dictionary, the expression 'savoir faire' means: ': capacity for appropriate action, especially: a polished sureness in social behavior. I decided to translate it as 'skills', that is, 'vještine'.

The word parvis, also according to Merriam Webster dictionary, means: ': a court or enclosed space before a building (such as a church); a single portico or colonnade before a church.' I decided not to translate it, and to leave the word 'parvis', followed by the explanation of what it is: 'trg ispred katedrale'..

The following paragraph contained some more architectural phrases, as well as other challenging words and phrases: 'As we walked through the lattice of roughly hewn oak beams, the curved tops of the church's soaring limestone vaults spread like gray elephant backs beneath our feet. Dust pooled in the hollows. From below, inside the church, I'd never imagined this

backstage world—the world of the cathedral builders. At the crossing of the transept and nave, I looked up into the intricate wood skeleton of the spire.' 'Roughly hewn oak beams' became 'grubo sječenih hrastovih greda'. 'The curved tops of the church's soaring limestone vaults' became 'zakrivljeni vrhovi uzdignutog vapnenačkog svoda.' 'Transept and nave' became 'transept i brod', and 'intricate wood skeleton of the spire' became 'zamršeni drveni toranj katedrale'.

While translating the next paragraph, I've encountered similar problems regarding architectural terms and the conversion of feet into meters: 'But this time I was on scaffolding, looking down into the giant hole the spire made when it crashed through the stone vaults. The top of it punched a second hole in the nave; a third formed at the north end of the transept. As the fire raged through the forest, triangular trusses of oak, 32 feet high, toppled like dominoes onto the vaults, and debris fell through the holes. At the crossing, charred wood and stone were piled around four feet high on the cathedral floor.' 'Scaffolding' became 'skela', 'stone vaults' became 'kameni svod', 'triangular trussed of oak, 32 feet high' became 'trokutne grede hrasta visoke 10 metara'. Lastly, I've converted four feet into 'over a meter high', or 'veće od jednog metra'.

'The Research Laboratory for Historical Monuments', also the Historical Monuments Research Laboratory (LRMH) is a part of the French Ministry of Culture. Because I couldn't find an official Croatian Translation, I've translated it literally as 'Istraživački Laboratorij za Povijesne Znamenitosti'.

I had to convert another measure unit, so '56 miles-an-hour' became '90 km/h'.

The following sentence contained a couple of phrases, but they didn't need to be changed too much in order to be understood: 'The general turned his eyes to the ceiling and emitted a tuneless whistle, to illustrate what head-in-the-clouds time-wasting looks like.' I translated it as: 'General je zatim uputio pogled prema stropu i bešumno zazviždao kako bi pokazao što znači kada netko gubi vrijeme gledajući u oblake.' They weren't translated literally because 'head-in-the clouds time-wasting' cannot be 'traćenje-vremena glavom-u-oblacima' in Croatian.

The phrase 'wears his heart on his sleeve' was translated as 'otvoreno pokazuje emocije'. In another paragraph, the phrase 'nip in the bud' appeared, which I translated using an idiom in Croatian ('sasjeći u korijenu').

Once again, I've had to use conversion, this time to covert '1400 Fahrenheit' to '750° Celsius.' Also, I've converted 'foot-long', 'two-foot-thick' and 'four inches' into 'oko 30 centimentara', '60 centimetara' and '10 centimetara'.

In the text, a group carrying the name 'Carpenters Without Borders' is mentioned. I decided to translate their name into Croatian, in order for readers to get the perspective of what it means, but I've left the original English name in brackets.

I have had trouble translating the sentence 'Medieval carpenters worked their wood green, and so did Carpenters Without Borders.' I decided to translate the problematic phrase 'worked their wood green' as 'obrađivali su sirovo drvo'.

In the next paragraph, the word 'doloire' appears. When I tried translating the word from French into Croatian, it was translated as, amongst other, an axe. But, the text gives a further explanation of how it looks, so I have translated the explained part, and left the word 'doloire' as in the source text. I have also provided the definition of the word in a footnote.

3. TRANSLATION OF THE SOURCE TEXT II

3.1 . Introduction

The second text is also an article from National Geographic. The text talks about the Earth's oceans. More specifically, about a future ocean which will appear due to the moving of the tectonic plates. It also mentions the oceans of the past, which existed millions of years ago and whose traces still exist today. The style of the text is semi-formal, and it comprises many scientific terms as well as some idioms and phrases. I have not encountered too many difficulties while translating it.

Translation brief:

1. Genre: online magazine article, news report; geography, history, science
2. Source: National Geographic Magazine (Online), published on June 8, 2021, written by Maya Wei-Haas
3. Audience: Wide audience, anyone interested in the history of the Earth's oceans and in the formation of a new one
4. Purpose of writing: The purpose of the text is to inform the reader of the history of the Earth's past and future oceans, how they were created and how they vanished.
5. Authenticity: original article by National Geographic
6. Style: online magazine article, news report, informative
7. Level of formality: formal
8. Layout: The article is written in third person, in many short paragraphs
9. Content: The author switches from talking about the remains of the Earth's past oceans, how the moving of the tectonic plates affects the formation of oceans, where and when will new oceans form etc
10. Cohesion: Lexical cohesion is achieved by using scientific terms
11. Sentence patterns: The author uses longer sentences and both past and present tenses
12. Terminology of the subject: The terminology of the text comprises of both scientific terms, which are more common, as well as some idioms and phrases used in everyday life

3.2. Translation

Zemlja je imala i izgubila mnoge oceane. Evo gdje idući može nastati.

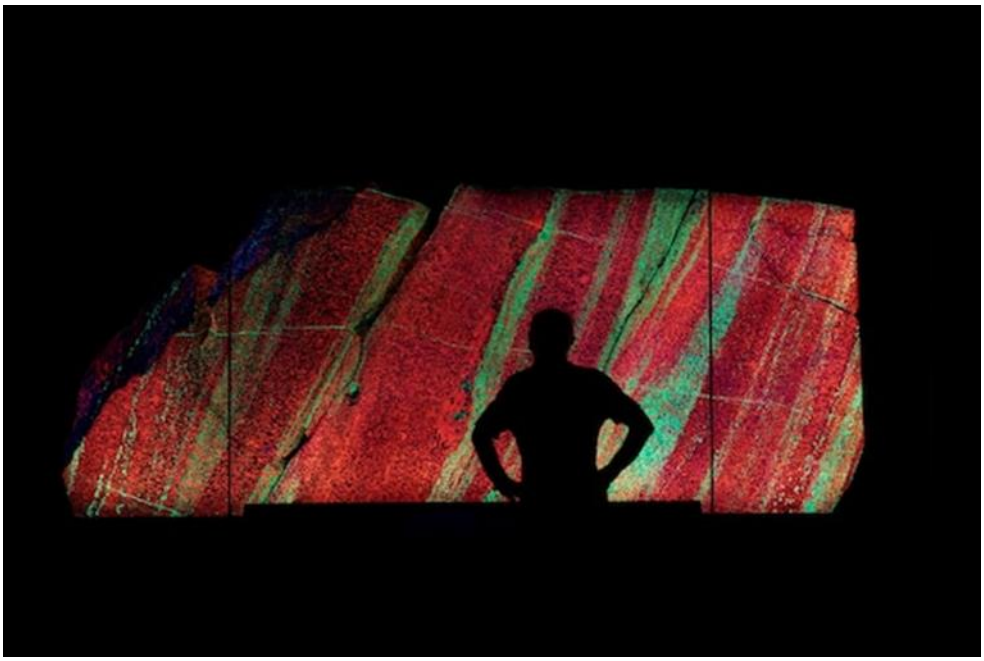
Geološki tragovi iz daleke prošlosti našeg planeta ukazuju na to da današnje obale neće zauvijek postojati – nastat će nove te zauzeti njihovo mjesto

U mračnoj sobi američkog prirodoslovnog muzeja u New York-u, zid skromnog kamena proteže se gotovo do stropa. Na prvi pogled, izgleda kao ploča namijenjena za kuhinjski otok ili radnu površinu, prekrivena crnim, bijelim i ružičastim mrljama koje čine skupiu minerala te se protežu visoko iznad moje glave. No, zatim se rasvjeta promijeni iz bijele u crnu, nakon čega ta gromada od deset tona postane neonski narančasta i zelena.

„Ne možeš se ne začuditi“, kaže George Harlow, kustos novo otvorenog dijela muzeja pod nazivom ‘’Dvorana dragulja i minerala Mignone’’, gdje se kamen nalazi.

Ta prekrasna živost izdaje jedinstvenost minerala: Nastali su na dnu sada već nestalog oceana prije otprilike 1,2 milijarde godina, u vrijeme kada su vretena algi manjih od rižinog zrna bila jedna od najvećih oblika života. U ovom prastarom oceanu, čestice bogate metalima su se uzdigle iz hidrotermalnih izvora te nakupile na morskom dnu u slojevima, stvarajući neuobičajenu mješavinu elemenata koji sada svijetle flourescentno kada su izloženi ultraljubičastom svijetlu.

To kamenje je živi podsjetnik na to koliko su se naši oceani promijenili tijekom miljardi godina povijesti – pokrenut mrežom nestabilnih tektonskih ploča našeg planeta. Pomicanja istih djeluju kao padanje domina kroz geološke atmosferske i biološke sustave, te tako utječu na sve počevši of raznolikosti zemljinih minerala do putanja oceanskih struja te atmosferskog protoka. Sve ovo utječe na život kakav danas poznajemo.



Ova ploča flourescetnog kamena veličine zida, pronađena u Ogdensburg-u, New Jersey, predstavlja dio sada nestalog oceana koji je postojao prije otprilike 1,2 miljarde godina.

,‘Promjene u cijelokupnom sustavu Zemlje koje se događaju kao dio zemljopisnih mijena velike su‘‘, rekao je Shanan Peters, geograf sa Sveučilišta Wisconsin-Madison, koji se bavi koevolucijom života i zemljinih sustava.

Ploče očuvanog morskog dna kao što je ova, uz mnoštvo drugih geoloških tragova, pomažu znanstvenicima oživjeti zapetljanu povijest oceana izgubljenih u vremenu – Iapetus, Rheic, Tethys, Panthalassa, Ural i mnogi drugi. Naši moderni oceani će, kao što su i ove prastare vodene površine, s vremenom nestati te će nastati novi.

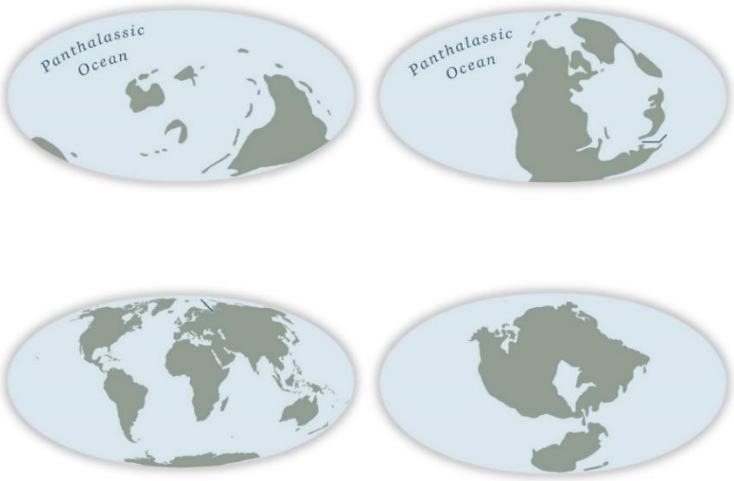
Kao što je Harlow pojednostavio: ,,Neprestano se stvari mijenjaju.‘‘

Tragovi urezani u morsko dno

,‘Zbog tektonskih ploča našeg planeta koje se stalno pokreću ne nastaju samo planine i doline, one također otvaraju i zatvaraju oceane u ciklusima – gotovo poput harmonike‘‘, rekao je Andrew Merdith, tekotnski modelar sa Sveučilišta u Leeds-u.

Kretnje su pokrenute zbog subdukcijih zona, u kojima se jedna ploča podvlači pod drugu. Ovom kretnjom morsko dno se reciklira u utrobu našeg planeta i povlači zemlju sa sobom, šireći tako razmak između kontinenata.

Pogledajte kako se Zemlja mijenjala



Kamena ploča u američkom prirodoslovnom muzeju, na primjer, potječe iz Ogdensburga, New Jersey, a očuvana je tijekom prastarog sudara kontinenta prethodnika Sjeverne Amerike i drugog prastarog kontinenta. Sudar je razorio ocean između kopnenih masa, skorivši slojevite naslage morskog dna pod visokim temperaturama i tlakom u današnju kamenu ploču. Čak i manji komadi prastarog morksog dna koji su očuvani na kopnu, kao što je kamenje iz New Jersey-ja ili komad zemljinog plašta iz Maryland-a, daju samo male naznake o mijenjajućim oceanima. Kako bismo bolje razumijeli ove kretnje, neki znanstvenici se okreću tragovima koji su urezani u morsko dno: magnetnim mineralima.

Rađanje oceanskih tektonskih ploča odvija se u najdužem planinskom lancu na svijetu: podvodnom lancu poznatijem pod imenom srednjo-oceanski hrbat. Proteže se oko 65 000 kilometara oko našeg planeta te označava mjesto gdje se tektonske ploče razdvajaju i gdje vrući kamen iz zemljinog plašta izvire prema gore kako bi popunio prazninu. Hlađenjem ovog kamena, neki minerali se usklade sa zemljinim magnetnim poljem, stvarajući geološki barkod

preko morksog dna, kojem su dodane nove crte svaki put kada se polje okrene. Znanstvenici mogu koristiti ove barkodove kako bi s vremenom pratili naše oceane koji se stalno pomiču.

Duhovi prošlosti oceana

Magnetski zapis, doduše, nije savršen: ‘‘Što se više vraćamo u prošlost, postoji sve manje i manje oceanskog kamenja’’, rekla je Grace Shephard, geofizičarka i stručnjakinja u rekonstruiranju pomicanja tektonskih ploča sa Sveučilišta u Oslu. Osim manjeg pojasa ispod Mediterana – koji je star čak 340 milijuna godina – većina morskog dna datira tek 100 milijuna godina u prošlost, a većina je mlađa od 200 milijuna.

No, znanstvenici su pronašli način kako identificirati dna nestalih mora, koja su se povukla u zemljin plašt te koja se sada skrivaju u oceanskom groblju.

Ova metoda uključuje praćenje brzine seizmičkih valova potresa koji pogađaju Zemlju. Komadi izgubljenog morskog dna mogu ostati djelomično hladni oko 250 milijuna godina, a seizmički signali se razlikuju kada prelaze preko hladnih područja i preko Zemljine goruće unutrašnjosti.

,‘Oduvijek smo imali crnu kutiju ispod sebe‘’, objašnjava Douwe van Hinsbergen, stručnjak za tektoniku ploča pri Sveučilištu u Utrechu u Nizozemskoj. No, seizmičke analize sada znanstvenicima omogućuju da proučavaju ove prastare ploče te da pomaknu geološki sat unazad, kako bi pokušali razumijeti podzemne sile koje pokreću naš svijet. Ovi sablasni ostaci morskog dna skrivaju se gotovo ispod svakog kontinenta, a van Hinsbergen i njegovi suradnici zabilježili su gotovo stotinu istih u takozvanom ,‘Atlasu podzemlja‘’.

Među najstarijima su komadi oceanskih tektonskih ploča stari do 250 milijuna godina, koji se sada nalaze na granici između plašta i jezgre. U to je uključen ocean Paleo-Tethys koji se nekada prelijevao preko obale Gondwane, superkontinenta koji se sastojao velikim dijelom od današnje južne Amerike, Afrike, Indije, Arapskog poluotoka, Australije i Antarktike.

Spajajući ove izgubljenje komade morskog dna, magnetskih barkodova, i mnogih drugih geoloških tragova, znanstvenicima se omogućuje da naprave predivnu rekonstrukciju milijardu godina povijesti našeg planeta.

Merditch, jedan od arhitekata tog modela naznačuje da ovo nije konačni izgled rane Zemlje te da se može promijeniti ako dođu do više podataka. No, gledajući video ovog plesa kontinenata i oceana ističe očaravajuću prirodu površine našega planeta koji se stalno mijenja.

,‘Sve je to dio globalne zagonetke,’’ rekao je Shephard.

Mreškanje kroz staništa Zemlje

Dok se oceani stvaraju i nestaju, i dok se kontinenti pomiču, okoliš koji je u stalnoj mijeni, priprema se za promijenu načina života. Stvaranje novog oceana, primjerice, može biti blagodat za bioraznolikost, kao što je to bio slučaj prilikom razdvajanja Pangee, prema tvrdnji Petersa i njegovih kolega.

Pangea je sadržavala skupine predaka svih važnih kopnenih živih bića koja danas postoje, objašnjava Peters. Nakon što se taj superkontinent razlomio u komadiće, kopnene životinje su se razvile u raznolikosti boja, veličina i načina života na vlastitim izoliranim područjima. Novi načini kruženja oceana raznosili su vlagu u unutrašnjost kontinenata, pretvarajući prijašnje suhe pojaseve u vlažne. U međuvremenu, na rubovima epikontinentalnih pojasa stvorili su se pojasevi osunčanih plitkih voda, gdje je morski život bujao.

''Ti rubovi pojasa su takozvani prvi razred ako si školjka ili riba ili nešto slično‘', rekao je Peters. Kada se Pangea razdvojila, život na Zemlji je procvjetao.

Čak i malena pomicanja tektonskih ploča mogu imati znatan učinak na površinski svijet. Jedan posebno zapanjujući primjer je stvaranje panamskog tjesnaca, komadića zemlje koji spaja sjevernu i južnu Ameriku, objašnjava Peters. Voda je tekla kroz ovu oceansku žilu iz Atlantskog do Tihog oceana prije otprilike 20 milijuna godina. No, kako se pacifička ploča podvukla pod karipsku, morsko dno se podiglo i povuklo podvodne vulkane na površinu.

Vodena veza između oceana se počela smanjivati te je naposljetku potpuno prekinuta. Zbog ove promjene, tople vode su se podignule sjevernije te je nastala nova struja koju danas nazivamo golfskom strujom. Ona je povećala temperature u sjeverozapadnoj Europi te donjela relativno blagu klimu u tu regiju, iako je slične udaljenosti sjeverno od ekvatora kao i hladniji dijelovi Kanade.

Ova promjena je također postavila uvjete za moderne oceanske struje, koje kontroliraju oluje, protok hranjivih tvari i drugi čimbenici.

''Zatvaranje panamskog tjesnaca imalo je ogroman učinak," rekao je Peters.

Nadolazeći oceani

U budućnosti našeg planeta slijedi još puno svjetski važnih razmicanja tektonskih ploča. Oko 250 milijuna godina od sada, svo kopno na zemlji će se možda još jednom formirati u superkontinent: Pangea Ultima. U ovom potencijalnom scenariju, koji je osmislio Christopher Scotese, voditelj projekta PALEOMAP, Atlanski ocean se gotovo zatvara te je ograničen na zaljev.

No, geološka budućnost je nesigurna. Možda bi se moglo dogoditi nešto sasvim suprotno te bi se Tihi ocean mogao zatvoriti i formirati superkontinent na drugoj strani svijeta koji bi se zvao Novopangea. No, drugi modeli predlažu da bi kombinacija promjena mogla dovesti do toga da se i Atlanski i Tihi ocean zatvore te da se novi oceani formiraju u Aziji.

Kakav god scenarij nas čekao u daljnoj budućnosti, tektonske promjene su već pristune. Znanstvenici vjeruju da bi se sljedeći novi ocean mogao formirati u istočnoafričkoj rascjepnoj zoni, gdje se uzdiže niz vrućih stijena te polako razdvaja pojas zemlje uzduž istočne obale kontinenta, objašnjava Cynthia Ebinger, geofizičarka na Sveučilištu Tulane, koja je provela opsežna istraživanja na tom području.

U današnjem dobu, to razdvajanje ima ozbiljne posljedice, kao što i dokazuje izobilje vulkanske aktivnosti u ovom dijelu svijeta – uključujući i razornu erupciju planine Nyiragongo u Demokratskoj Republici Kongo zbog koje se nedavno iselilo do 400 000 ljudi i umrlo najmanje 32. Drugi vulkan, na obali Eritreje, ima drugačiji učinak: zaustavlja Crveno more i štiti od poplava dijelove sjevernoistočne Etijopije koji se nalaze ispod razine mora, rekao je Ebinger. U ovoj regiji se nekoć formirao mali ocean, i dok je voda odavno presušila, tektonske ploče bi naposljetku mogle osloboditi novi val poplava.

Dok je tektonika glavni faktor geološke povijesti i budućnosti našeg planeta, postoji i druga snažna sila koja danas utječe na zemljine procese: mi. Ljudi u neviđenim količinama u atmosferu oslobađaju plinove koji zagrijavaju planet, mijenjajući oceansko i atmosfersko kruženje uz smrtonosne posljedice. Kroz uvoz i putovanja ljudi također utječu na miješanje ekosustave kao nikad prije.

,,To je proces koji Zemlja nikada prije nije doživjela, ikada. Niti jednom.‘‘ rekao je Peters.

Doba ljudi je samo treptaj u geološkom vremenu, no naši postupci će zasigurno ostaviti neizbrisive tragove na naš planet, pogotovo miješanje biosfere, rekao je Peters.

,,Posljedice će biti prisutne u svakom organizmu koji će postojati u budućnosti,‘‘ rekao je, ‘‘na isti način kao što i Pangea postoji u svakom organizmu koji se danas nalazi na Zemlji.‘‘

3.3. Commentary and analysis

I have encountered a few difficulties while translating this text, some of them because it contained scientific terms. However, I have had more trouble with few idioms and phrases which I couldn't translate literally as it would sound illogical and unnatural. The scientific terms seem difficult to translate at first glance, but because most of them are of Latin origin, they sound pretty similar in most languages and actually aren't that difficult to translate. For example: 'hydrothermal' translates to 'hidrotermalni', 'seismic' is 'seizmički' and 'algae' are 'alge.

The first idiom I encountered was 'You cannot help but drop your jaw.' When translated into Croatian literally, it would be 'Ne možeš si pomoći da ne spustiš čeljust.', which doesn't really make sense, so I've decided to keep it relatively simple and unlike in English, unmetaphorical, and translate it as 'Ne možeš se ne začuditi.'

I had some trouble translating the word 'ever-shifting', because the literal translation would be 'uvijek-mijenjajući', which would not sound natural in Croatian whatsoever. Also, participles are not that commonly used in Croatian as they are in English. I decided to translate it as 'nestabilan' or 'unstable'.

The text mentions the names of a few ancient oceans – Iapetus, Rheic, Tethys, Panthalassic and Ural. In order to provide the best possible translation, I have tried to find the Croatian names for these oceans. I have found them in a Croatian text named 'Historijska geologija I – prekambrij i paleozoik'. All the names have remained the same, except Panthalassic, which is 'Panthalassa' in Croatian.

Another phrase I had trouble translating was 'Things haven't stopped.' I couldn't translate it as 'Stvari nisu stale.' In Croatian because it doesn't make much sense nor does it mean the same thing as in English. I decided to translate it as 'Neprestano se stvari mijenjaju.', which , when back-translated, reads as 'Things are constantly changing.'

The phrase 'See Earth's changing face' couldn't be translated literally, so I translated it as 'Pogledajte kako se zemlja mijenjala'

When translating the sentence 'Those shelf edges are prime real estate if you're a clam or fish or something like that,' I opted to translate the phrase 'prime real estate' as 'prva klasa', meaning 'first class'. So, the entire sentence was translated as follows: 'Ti rubovi pojasa su takozvana prva klasa ako si školjka ili riba ili nešto slično.'

I had some trouble translating the following sentence: ‘The change also set the stage for the modern conveyor belt of ocean currents…’, so I decided to simplify it, because a literal translation wouldn’t work. I translated it as: ‘Ova promjena je također postavila uvjete za moderne oceanske struje.’ This is translated as: ‘This change also set the conditions for modern oceanic currents.’

Another sentence which I’ve found slightly complex is: ‘…where a rising plume of searing hot rocks is slowly forcing apart a swath of land along the continent’s eastern coast…’. I’ve contemplated whether I should translate ‘hot rocks’ literally, because I wasn’t sure if the author was talking about literal rocks which are hot, or was it a scientific term for a part of the Earth’s crust or mantle. In the end, I decided to translate it as: ‘….gdje se uzdiže niz vrućih stijena te polako razdvaja pojas zemlje uzduž istočne obale kontinenta….’

Regarding the scientific terms, some of the more complex ones were: ‘spindles of algae’, ‘hydrothermal vents’, ‘seismic waves’, ‘subterranean forces’, ‘a boon for biodiversity’, ‘desiccated belts’, ‘shelf edges’, ‘balmy climate’, but I’ve managed to translate them all because, like I’ve mentioned earlier, they sound quite similar in most languages, so it wasn’t that difficult. For example, ‘algae’ are ‘alge’ in Croatian, ‘hydrothermal’ is ‘hidrotermalno’, ‘seismic’ is ‘seizmički’, ‘biodiversity’ is ‘bioraznolikost’, which is also a calque translation. In order to translate these terms, I have used Glosbe dictionary.

4. TRANSLATION OF THE SOURCE TEXT III

4.1. Introduction

The third text is a travel offer taken from the official website of *Integral Zagreb* tourist agency. The offer includes a trip to Egypt and a Nile cruise. It is written in a formal style, and it is characterized by very short sentences. It includes a short introduction about the beauties of Egypt, followed by an itinerary which describes what each day on the trip entails. It also includes optional trips, flight information, as well as included and additional charges, trip insurance, visa formalities and general information about Egypt, such as the currency, language, weather and climate. The text wasn't overly difficult to translate, however I have had some trouble with the aforementioned very short sentences, because I was not sure whether to translate them literally or to change the structure.

Translation brief

1. Genre: travel offer
2. Source: Integral Zagreb Tourist Agency's website
3. Audience: wide audience, anyone who is interested in travelling to the destination in question
4. Purpose of writing: The purpose of this text is to attract people who are interested in travelling to Egypt
5. Authenticity: original travel offer from Integral Zagreb
6. Style: online travel offer, informative
7. Level of formality: formal
8. Layout: The article is written using simple language. It comprises of an introduction, itinerary, price details, visa conditions, additional notes, flight information etc
9. Content: The introduction comprises a few sentences about the beauties of Egypt, the itinerary comprises of a detailed description of each day, and the remaining part of the offer comprises of price details, flight information etc

10. Cohesion: Lexical cohesion of achieved by using topic appropriate language and terminology
11. Sentence patterns: short and simple sentences, present tenses
12. Terminology of the subject: travel related terminology, the names of Egyptian cities and monuments

4.2. Translation

A trip to Egypt and a Nile cruise from Aswan to Luxor in 2023

Egypt and a Nile cruise in November 2023

Alexandria – Cairo and the pyramids of Giza – a Nile cruise from Aswan to Luxor – Hurghada

Travel dates: 14th – 22th November 2023

For tourists, a trip to Egypt, one of the world's most attractive countries, is like travelling to an open museum, which has continuously, for millennia, resisted time and oblivion. When it seems like you have seen and experienced something unique, the next legendary landmark will seem even more attractive and will fill this trip up with a variety of exciting experiences which line up one after the other. The trip beings on the Mediterranean coast in Alexandria, followed by the Great pyramids of Giza and the city of Cairo. The next part of the trip is a cruise on the Nile including a tour of various impressive archaeological sites. The trip ends in the Hurghada resort on the Red Sea. Desert landscapes, historical mystique, and the current lives of the residents are some of the things that remain in our memory a long time after we return to our daily lives.

Itinerary:

Day 1 Zagreb – Istanbul – Alexandria

All travel participants are to meet at the Franjo Tuđman airport in Zagreb at 6 p.m. by the central information desk. The guide will collect all travel documents and basic information about the passengers, after which they will be registered on flight TK 1056 which takes off at 8 p.m. The flight lands in Istanbul at 12.10 a.m. local time.

Day 2 Alexandria – Cairo

The trip continues on flight TK 696 to Alexandria which takes off at 01.35 a.m. and arrives at 2.50 p.m. The flight is followed by custom formalities, baggage claim and afterwards, transfer to a hotel for a short overnight stay and breakfast. Sightseeing. Situated on the Mediterranean coast, Alexandria is the second largest city in Egypt. It was founded by Alexander the Great, and it was an important centre of Hellenistic civilisation. The architecture, culture and the wealth of the city used to be competition to Athens and Rome. Sightseeing starting with a tour of St Mark's cathedral, Qaitbay Citadel which dates back to the 15th century AD and offers a pretty view of the city, and Cornishe promenade, with a short stop at the new Bibliotheca Alexandrina. A tour of the Kom el-Shugafa catacombs, a large 2nd century AD necropolis. It is a mixture of roman, Hellenistic and pharaonic artistic elements which can be seen in the paintings and in the style in which the statues, funerary motifs as well as the tombs were built. This is followed by a tour of the archaeological site and the remains of the Serapeum temple from the 3rd century AD. Lunch at a restaurant during the day. Departure for Cairo in the afternoon. Upon arrival, check-in at a hotel, dinner, and an overnight stay.

Day 3 Cairo and the Pyramids of Giza

Breakfast. Arrival at Giza, a site near Cairo, and a tour of the legendary pyramids, masterpieces of ancient architects. They must be the first thing to come to mind when mentioning Egypt. The magnificent pyramids of Khufu/Cheops, Khafre and Menkaure were considered one of the seven wonders of the ancient world and even today these monumental and mysterious structures are considered some of the most famous in the world. There is also the famous Sphynx, a sculpture of a lion bearing a human head. It is one of the largest sculptures in the world carved from a single rock, reaching a height of 22 metres and length of 73 meters. Return to Cairo, the largest city in Africa. A visit to the Egyptian national museum which holds a large collection of objects from numerous archaeological sites across the country, including Tutankhamun's gold mask and sarcophagus. Lunch during the day. Visit to the old part of the city, and the famous Khan El Khalili market where you can buy almost anything. Heading to the train station in the early evening hours and accommodation into trains cabins, which will take us to Aswan. Dinner and overnight stay in the train, and a night drive to Aswan.

Day 4 Aswan

Breakfast. Departure from the train and continuation of the journey by bus. A visit to the ancient Aswan quarry where obelisks were carved and afterwards transported over the Nile to the

temples. An unfinished, 41 meter long obelisk can be seen, but it is still a mystery as to how and with which tools the stonemasons handled huge granite rocks in those ancient times. A tour of the Aswan dam, the world's second largest dam which is over 100 meters tall. Afterwards, accommodation on a 5-star ship to sail the Nile for the following three days. Lunch and rest on the ship. In the afternoon (hours) an optional trip to Philae temple dedicated to the goddess Isis. The temple has been moved to a new location to avoid drowning when the Aswan dam was being built. After sightseeing, an optional trip to a Nubian village where one can see the traditional way of life. Return to the ship, dinner and an overnight stay.

Day 5 Aswan – Kom Umbu – Edfu / Abu Simbel

An optional trip to Abu Simbel. Early departure and a drive through the dessert landscape at dawn, to Abu Simbel and the temples dedicated to Ramses II. and his wife Nefertari. The monumental entrance is highlighted by four pharaonic sculptures 18 meters in length. The Ramses sculptures are the second largest in Egypt, the only larger one being the Sphynx. Return to the ship. After lunch sailing the large legendary river which means life to this region, and which creates a lush valley in the heart of the desert. In the afternoon, arrival at the Kom Umbu temple situated on the bank of the Nile. It is the only temple dedicated to two gods: Sobek and Horus. It has been restored and it is one of the most beautiful temples of the Ptolemy era. Return to the ship, sail towards Edfu. Dinner and an overnight stay on the ship.

Day 6 Edfu – Luxor

Breakfast. Departure from the ship in order to visit the temple of Horus in Edfu, which is one of the most preserved temples in Egypt, consisting of a plethora of drawings and hieroglyphs. The temple has been buried in sand for almost 200 years, which helped the preservation of the building. Its many wall engravings provided historians with valuable information about that certain period of Egyptian history. We will continue sailing through the sluice in Esna towards Luxor. Upon arrival, we will visit the magnificent ancient Egyptian temple complex of Luxor (ancient Thebes), built around 1400 B.C., which was very significant in those times. It is considered that this temple was the place where the pharaohs were coronated. During the roman times it was turned into a fortress which was a centre of roman power. The temple is connected to another giant temple called Karnak through the Avenue of Sphynxes which has recently been restored, and where one can take a walk. Return to ship to have dinner.

Day 7 Valley of the Kings – Karnak – Hurghada

Breakfast and departure from the ship. Arrival to the Valley of the Kings where 63 royal tombs from the period since 1550 to 1070 B.C. are located. Unlike the pharaohs from the Old Kingdom, who were buried in pyramids, the pharaohs from the XVII. to the XX. dynasty were buried in the Valley of the Kings, in underground tombs, deep in the stone cliffs. They differ one from the other, but they were all lavishly decorated and painted. Many tombs were damaged and robbed by tomb raiders and efforts have been made to renovate as many of them as possible. We will then explore the cascade temple of the queen Hatshepsut that is located underneath the rocks which are the same colour as the building itself, making it seem like one large unit. Then we will tour the Colossi of Memnon, two large 14th century B.C. stone statues which are in a seating position. Departure to Karnak, the largest ancient temple complex in the world, which is dedicated to the god Amon, and which was the centre of religious life in the ancient times. The temple area was built upon for more than a thousand years. The entrance to the temple is through the Avenue of the Sphynxes, and inside the temple one can see magnificent chambers decorated with reliefs and statues, as well as spacious yards and giant columns. Some are even 24 meters high, and 3.5 meters wide. After sightseeing and lunch during the day, departure to the famous resort on the Red Sea, Hurghada. Upon arrival, dinner and overnight stay.

Day 8 Hurghada

An all-inclusive stay in Hurghada. A free day to swim, do desired activities or take an optional fieldtrip by boat.

Day 9 Hurghada – Istanbul – Zagreb

Early rising and transfer to the airport. Check-in to flight FK 703 which departs from Hurghada at 3.45 AM and lands in Istanbul at 7.45 AM. Transfer to the city. A tour of Istanbul accompanied by a guide, followed by leisure time before returning to the airport. The journey will continue on flight TK 1055 which will take off at 7 PM and arrive in Zagreb at 7.10 PM.

Price per person:

First minute: 1.560 € (11.746,80 HRK)

Regular price: 1.590 € (11.972,70 HRK)

The price includes:

- Transportation via airplane in economy class (according to itinerary)
- Airport taxes
- 1 night stay in a 4- or 5-star hotel in Alexandria, breakfast included
- 1 half-board in a 5-star hotel in Cairo
- 2 all-inclusive nights (stay) in a 5-star hotel in Hurghada
- 3 full-boards on a 5-star boat while cruising the Nile
- 1 half-board in a train, relation Cairo – Aswan
- 3 additional lunches in local restaurants
- tour guide in Croatian
- local guide in English
- All transportation in air-conditioned tourist buses
- Sightseeing (according to the itinerary) and tickets for all sites to be visited
- Travel organisation costs

The price does not include:

- Surcharge for a single room/boat cabin/train cabin – 339€ (2.554,20 HRK)
- Checks on entry visas 25€, which is issued at the airport upon arrival in Egypt, and is paid for on the spot
- Tips for local guides and drivers (paid for on the spot, approx.. 50€ for the whole trip)
- Travel insurance

Optional

- Trip/tour to Abu Simbel - 120€ per person/minimum of 10 people
- Philae temple - 35€ per person
- Nubian village - 35€ per person
- Luxor: Sound & Light - 45€ per person

- During applications, it is necessary to give notice when one wants to apply/sign up (for any optional trips), and it is paid for on the spot

Minimal number of passengers in the group: 20

notes

- The price quoted applies to accommodation in double and triple rooms
- The train has no triple compartments/. If there is a party of three, they should use a double and single compartment, but the surcharge for a single compartment is 320 HRK

Visa

- In order to enter Egypt, a Croatian citizen requires a visa. Their passport must be valid for at least another six months, and have two blank pages. The visa is obtained at the airport upon arrival
- We kindly ask that you provide your information at least 30 days before departure:

First and last name (as stated in your passport)

Date of birth

Passport number, date of issue and expiration date

The accuracy of the given information is the responsibility of the passenger, and the agency is not responsible in case that any problems arise from inaccurate information, nor does it bear financial responsibility

Covid-19 conditions/constrains

- There are no constrictions on entry to Egypt. At the moment, all one needs is a passport and a visa

Flight information:

- Carrier: Turkish airlines
- Permissible weight of luggage is 30 kg (included in the price) + 1 piece of hand luggage up to 8 kg

- The itinerary lists local arrival/departure times
- The airline reserves the right to change flight times

Notes

- The hotel categorisation corresponds to the official categorisation of Egypt, and can differ from the European categorisation
- Invalid travel documents that result in the cancellation of the trip do not, in case, bind the travel organizer, and the appropriate conditions ????? (uvjeti otkaza putovanja organizatora?
- The travel organiser keeps the right to modify the travel itinerary as well as the flight schedule (when the travel situation requires so), however the itinerary will be followed completely.
- Airport taxes are subjected to change, the final amount is determined on the date of issue of flight ticket, approx.. 14-7 days before departure, and according to the conditions of the airline which are applicable to groups, they are issued for all passengers at on the same day.
- If the prices of calculative elements were to increase over 5%, the travel agency has the right to change the price of the entire arrangement. Date of submission of the offer: November 15th, 2022

General travel conditions apply to the aforementioned arrangement. When applying, you are signing a contract including the General conditions and guidelines for travel arrangements. By signing, you agree to said conditions.

We kindly ask that if you have any questions regarding the safety of travelling to certain countries, you inquire with the Ministry of foreign and European affairs or visit their website: www.mvep.hr

Egypt:

- Official name: the Arab Republic of Egypt
- Population: 102 million

- Capital: Cairo
- Official language: Arabic
- Religion: the vast majority are Muslims
- Time zone: +1
- Currency: Egyptian pound (EGP)
- Current voltage: 220 V
- Vaccination: Not necessary
- Mobile networks: Orange, Vodafone, Telecom Egypt
- Area code: +20
- Shopping: farmers markers and shop offer traditional souvenirs, objects made out of gold, wood or leather, carpets, papyrus or similar items. Bargaining is a part of Egyptian culture and caution is required.
- Clothing and shoes: Because of fluctuating temperatures during the day and at night, we suggest dressing in layers, wearing warmer clothes in the evening, as well as wearing comfortable shoes.
- Food and drinks: We recommend consuming bottled drinks and not using ice, alcohol can only be consumed in hotel restaurants and bars. We recommend not eating street food.
- Climate: Subtropical desert climate, Mediterranean in the north of the country. Rain is rare, mainly in the form of short-term showers. From March to June, hot winds are common.

4.3. Commentary and analysis

This text was not very difficult to translate, however, some sentences were very short, and when translated into English, they sounded incomplete. But this is what most tourist agency texts look like, so we can simply translate these short sentences literally. Some of the examples are:

‘Doručak.’ – we cannot completely change the form of the sentence and translate it as: ‘We will be eating breakfast.’ or ‘Breakfast will be served.’, so we will just translate it as ‘Breakfast.’ The same goes for the sentence: ‘Razgledavanje grada.’, which I translated as: ‘Sightseeing.’

On the other hand, some sentences very overly long, which is common in Croatian, especially when describing something. In this case, the tourist agency was describing the beauties of Egypt, and the itinerary in general. Because it would sound unnatural in English, I have broken the sentence down into a few shorter ones. The sentence in Croatian was written as one: ‘Putovanje započinje na mediteranskoj obali u Aleksandriji, slijede velike piramide u Gizi i grad Kairo, zatim krstarenje Nilom uz obilazak zadivljujućih arheoloških nalazišta, a završava u ljetovalištu Hurgada na Crvenom moru.’ When translating into English, I have made three sentences: ‘The trip begins on the Mediterranean coast in Alexandria, followed by the Great pyramids of Giza and the city of Cairo. The next part of the trip is a cruise on the Nile including a tour of various impressive archaeological sites. The trip ends in the Hurghada resort on the Red Sea.’

Throughout the entire text, I encountered a problem similar to the first one I mentioned. Because most of the sentences were written simply and without using the 1st person plural, I wasn’t sure whether to add it or not. For example: ‘Tijekom dana ručak u restoranu. U popodnevnim satima polazak prema Kairu. Po dolasku smještaj u hotel, večera i noćenje.’ I wanted to translate it as: ‘During the day we will have lunch at a restaurant. In the afternoon we will depart to Cairo. Upon arrival we will check into a hotel, have dinner and stay the night.’ But, because the entire text is composed of such sentences and it would be quite different if I translated everything in this manner, I decided to translate it so that it sounds the same and carries the same meaning: ‘Lunch at a restaurant during the day. Departure for Cairo in the afternoon. Upon arrival, check-in at the hotel, dinner and an overnight stay.’

This text contains the names of many historical sights, persons, places etc., so I had to find their English equivalents. For example, ‘božica Izida’ in Croatian is ‘goddess Isis’ in English. The city ‘Asuan’ in Croatian in ‘Aswan’ in English. ‘Aleja Sfingi’ in Croatian translates to ‘the Avenue of the Sphynxes’ in English.

At the end of the text, there were some notes and general travel conditions, which were written in a sort of legal and professional way, so I had to be careful to use the right form to be able to convey the information in a proper way. There was a sentence which I had some problems with: ‘Neispravni putni dokumenti koji za posljedicu imaju odustajanje od putovanja, ni u kojem

slučaju ne obvezuju organizatora putovanja te se primjenjuju uvjeti Otkaza putovanja organizatora.' It sounded quite complex and unclear, so I had to think about its meaning first, and then translate it. I translated it as: 'Invalid travel documents that result in the cancellation of the trip , do not, in case, bind the travel organizer, and the appropriate conditions of the travel cancellation by the organizer apply.'

5. TRANSLATION OF THE SOURCE TEXT IV

5.1. Introduction

The last text in an interview conducted by Mladen Pleše for *Telegram.* He is interviewing Assistant Professor Igor Petrović, Ph.D. about his education, his career and his current job. It is written in a semi-formal style. I expected the text to be extremely difficult to translate because of the many medical terms in it, but in the end, it was not so complicated. Some extremely long sentences were more difficult to translate than the medical terms.

Translation brief

1. Genre: online magazine article, news report, informative
2. Source: Telegram Magazine (Online), published on February 6th, 2023, written by Mladen Pleše
3. Audience: wide audience, anyone interested in what a surgeon's job entails
4. Purpose of writing: The purpose of this text is to educate the reader on what a surgeon faces in his everyday life at work, all the difficulties that he must overcome. Also to show people how difficult it is to have a serious disease and to have to treat it.
5. Authenticity: original article from Telegram
6. Style: online magazine article, news report, informative
7. Level of formality: formal
8. Layout: The article consists of many short paragraphs
9. Content: The author talks about the surgeries the doctor has performed, the complications that arose, the difficulties of performing such complex surgeries, the patients' healing process, where he got his education from, what he is most proud of and what worries him most etc
10. Cohesion: Lexical cohesion is achieved by using medical terminology
11. Sentence patterns: Longer sentences are used, present tenses are used more commonly than past tenses
12. Terminology of the subject: medicine related terminology

5.2. Translation

Great stories

I operate on patients with severe diagnoses who others have refused to treat. The hardest part is telling them what their chances of survival are

Assistant Professor Petrović speaks to TELEGRAM about his education, career and reveals what the most important traits of a good surgeon are

Based on his own experience, Assistant Professor Petrović concludes that bonding with patients is the worst thing to do. 'The closeness and a possible subsequent bad outcome exhausts a doctor as a person.' After looking at the medical report, Assistant Professor Petrović notifies the patient, and then with their consent, he also notifies their family. 'All of this is often very uncomfortable and unrewarding.''

The first time the general public has heard of Assistant Professor Igor Petrović, Ph.D., from the Institute for Hepatobiliary Surgery and Transplantation of Abdominal Organs of the University Hospital Centre Zagreb, after one patient recently had a heart and liver transplantation. Associate professor Petrović was head of the surgical team responsible for the liver transplantation. It was the first time that such a high-risk surgery was performed in Croatia, and it is also rarely done in the world. The patient had a metabolic disease, amyloidosis, a pathological accumulation of protein in the heart, kidneys and liver, seriously damaged as a result thereof.

The consequence was a severe cardiomyopathy, i.e. disease of the heart muscle(s), which consequently led to a liver disease. All of this, however, caused ascites, an accumulation of free fluid in the abdominal cavity. Taking the patient's difficult health condition into consideration, it was decided that a combined surgery should be performed and that a heart transplant should be done first, followed by a liver transplant. A patient who had a heart transplant a few years ago, had a liver transplant six months ago, says Assistant Professor Petrović,

'For a patient, that would be a worse option: namely, the transplanted heart suffered because the liver constantly produced pathological amyloids, proteins which are usually not present in the body.'' Despite that, the liver would be functionally healthy, so a liver like this is sometimes used for transplantation, for example, in older patients who suffer from liver cell cancer.

Troubling information before the surgery

In the case of a 45-year-old patient, the liver has lost its function, which wasn't shown in the lab results, but a so-called cardiac cirrhosis of the liver occurred as a consequence of a long-term heart decompensation. The heart and liver arrived in Zagreb on two separate flights. The travel expenses are covered by a special Health Ministry fond for liver transplantation, and these types of transports are usually carried out by a government airplane.

Before the surgery, a disturbing, unverifiable piece of information came in, that the liver won't be arriving on time, i.e. within 12 hours after it was removed from the donor's body. ''However, we still decided to transplant the liver even if it was late, because there was no other solution.'', associate professor Petrović remarked and also added that the blood flow of the patient was luckily stopped in Germany two hours later than anticipated so the surgery could be done within the estimated time limit for a cold ischemia. Usually, the liver must be transplanted within 12 hours, while the heart has to be transplanted within 4 to 6 hours after being taken from the donor. 'We transplanted the liver and ensured that there was a blood flow within ten hours since the liver was 'clamped' in Germany and since the blood flow was stopped.''

The greatest challenge awaited the anaesthesiologists

The heart transplantation started around 6 AM and lasted until 11 AM when the patient was stabilized. Then, it was associate professor Petrović's team's turn. 'Technically speaking, it wasn't a great challenge, these surgeries have become a routine here at Rebro. The biggest challenge awaited the anaesthesiologists who had to neutralise the instability in the blood pressure and make sure that the transplanted heart has a corresponding function, for the liver to be transplanted.'

The surgery was completed around 5 PM. Associate professor Petrović was assisted by Ante Gojević and Jurica Žedelj, both Ph.D.s, scrub nurses, nurses Dijana Stiperski and Slavica Berić, anaesthesiologists Tina Tomić, Martina Čalušić and Karolina Režek, all of whom Ph.Ds., as well as anaesthesiology technician Nataša Gojak.

Long and thorough preparations for the procedure

Preparations for such a procedure were long and thorough. Only after the cardiologists, cardiac surgeons, abdominal surgeons, gastroenterologists, and anaesthesiologists were consulted, was it decided to proceed with the synchronised transplantation which the patient, as it was seen in the end, took very well.

In order to successfully transplant a liver, one needs an explantation team which takes the organ from the donor. When an intensive treatment unit has a patient who has been pronounced brain dead, it is immediately reported to hospital transplant coordinators. If the family gives their consent, the information about the donor is reported to the national coordinator of/ the Ministry of Health, and they send it to Eurotransplant. Unless there's a special emergency abroad, the liver is then sent to the University Hospital Centre Merkur or to Rebro (UHC Zagreb).

Three particularly demanding transplantations were done in seven days

During 2022, 106 transplants were done in Rebro, 18 of them since mid-December, all successful. In only seven days, three particularly demanding transplantations were carried out: a liver transplant from a live donor, a combined heart and liver transplant on a 45-year-old patient and a heart transplant on a 11-year-old. Such surgeries are very rare in the world. Cardiac surgeon and professor Hrvoje Gašparović said on the occasion that around 70% of patients have a high quality of life after a heart transplantation, and 90% a very good one. Up to now, 2500 kidney transplants were done at Rebro, and last year three children received kidneys. Associate professor Petrović says that Rebro is the only place where children get kidney transplants, and that is a rare occasion that two twin brothers got heart transplants.

There's been a serious organ donor crisis

Along with these brilliant results, a serious organ donor crisis emerged completely unexpectedly. Until COVID started, by kidney transplants per million inhabitants, Croatia was ranking as one of the best in the world, and even the best in 2010. Now, the donor number has decreased over 50%, and a similar trend was recorded in the world. 'It is the first time that people have been dying while on the waiting list because there aren't enough donors', reveals Assistant Professor Petrović. There are over 200 patients who are waiting for a liver transplant in Merkur alone.''

However, the number of liver transplants at Rebro is growing, especially after gastroenterologist professor Anna Mrzljak joined them from the University Hospital Merkur in 2021 and increased the mobilization of the recipients on the liver transplant list significantly. Professor Davor Mijatović, the head of the liver transplant team, and Assistant Professor Hrvoje Silovski, the head of the Department of Hepatobiliary Surgery both held an equally important role in the aforementioned liver transplant renaissance. As representatives of the middle generation of doctors, Assistant Professor Petrović and Tomislav Baotić, Ph. D. joined the program immediately, as well as Ognjan Deban, Goran Pavlek, Jurica Žedelj, Ivan Šeparović,

Ivan Romić and Iva Martina Strajher, all Ph. D., and all of whom perform liver explantations/plantations most frequently.

It it more difficult to transplant a liver than a heart

Not only do heart and liver transplants differ in the length of cold ischemia, the preservation of organs in a cooled preservative solution, they also differ in the severity of the procedure itself. For a layperson, it might be somewhat unbelievable that a liver transplant is both technically and temporally more demanding than a heart transplant.

‘’Actually, a liver transplant is the most difficult procedure in transplantation medicine, that is of course, if we exclude complex multiorgan transplants. Hepatectomy, the removal of a diseased/sick liver with a potential significant bleeding, can oftentimes be problematic and demanding, especially when re-transplanting it. Arterial anastomosis can also represent a challenge, because it can thrombose and lead to risk of organ rejection’’, as Assistant Professor Petrović explained. And in the end, an additional problem is the fact that there is no mechanical replacement for a functioning liver.

People are usually discharged after 7 days

A careful hemostasis is important in order not to lose a lot of blood. ‘’Patients who bleed less generally have a much better postoperative course, as well as an improved kidney and liver function’’, Assistant Professor Petrović notes and explains that the postoperative recovery of immunosuppressed patients is extremely sensitive in the context of infections. When performing liver transplants, a so-called piggy-back technique is used to preserve the continuity of the part of the inferior vena cava that is located behind the liver. The most common pathologies that lead to liver transplants are alcoholism which causes cirrhosis and hepatitis B and C viral liver infections. However, patients easily opt for a liver transplant because their quality of life is quite bad, and the post-operative recovery is quite fast. They are already functional after five days, and after 7 days they are often discharged to home care’’, Assistant Professor Petrović points out.

Only one acute rejection was recorded

In the 34 liver transplants that were performed in UHC Rebro since mid-December 2021, there was only one acute rejection, but it was very successfully medicated and the patient is now all right. There are patients who undergo two or three liver transplants during their lifetime. This is either because the underlying disease returns, because complications occur or because of

hepatic artery thrombosis. Assistant Professor Petrović notes that immunosuppressive therapy is extremely important during the post-operative recovery.

‘’There are very potent drugs which suppress the immune system and prevent possible rejection of the transplanted organ, i.e. they allow the survival of the donor’s organ in the organism of the receiver.

He received an additional education at UH Merkur

After graduating from the University Zagreb, School of Medicine, Assistant Professor Petrović was specializing in general surgery for 5 years at UHC Rebro, followed by two years of sub-specialization of abdominal surgery. After that, he became a subspecialist of abdominal surgery in 2010, while his narrower area of interest is hepatobiliary surgery, therefore, liver, bile ducts and pancreas surgery. Additionally, he pursued his academic career by finishing his masters and doctorate degree and he is now an Assistant Professor and the Faculty of Medicine in Zagreb. He has completed further education at UH Merkur where he monitored around 30 transplantations as well as numerous oncological procedures which were performed by chief surgeon Branislav Kocman and Assistant Professor Stipislav Jadrijević and other surgeons working there. ‘’I am grateful to them for everything that I have learned, and for the fact that we could copy their technique and procedure of liver transplants. Because the transplants at Merkur are performed at the highest level, there was no need for us to go abroad’’, says Assistant Professor Petrović.

His first knowledge of liver transplants was acquired at Rebro, where liver transplants have been performed in adults since 1990, and afterwards in children, with interruptions and varying frequencies. ‘’With all due respect, I would like to mention the names of Rebro’s liver transplanting doctors such as professor Vuk Borčić, Mato Škegra, Stipe Batinica and doctors Ante Gojević, Boško Romić and Zlatko Fiolić, our predecessors and teachers’’, Assistant Professor Petrović points out.

The adrenaline addiction fulfills him

He admits that the things which fulfill him the most are the adrenaline addiction, work in the OR (operating room) and challenging surgeries. However, the worst thing is when surgery is performed in the same way as the last 100 procedures, and things still go wrong.

‘’That is remembered more than the successful procedures. It is exhausting when patients have to spend a long time in the intense care unit after surgery when complications arise or when the

outcome is bad'', says Assistant Professor Petrović and explains that for the most part, the post-operative course depends on the general (medical) condition of the patient. ''If their condition is bad or if the patient has to go through immunosuppressive therapy, then serious complications can arise.''

Before every surgery, he studies the theory again

Before every surgery, he says, he always studies the theory again. 'In addition, the Internet and specialized surgical channels now feature procedures that demonstrate new techniques, such as pancreatography. One can also learn about post-operative complications which contribute to mortality rates significantly.''

But liver transplants are not the 'core business' of Assistant Professor Petrović. His main occupation is oncological and hepatobiliary surgery, the most difficult field in abdominal surgery because such tumors have the most difficult outcomes.

Without radical surgery there is no real benefit for cancer patients

Radical oncology surgery with lymphadenectomy is a special challenge for Assistant Professor Petrović. 'Without radical surgery, there's no real benefit from surgery for cancer patients. Oncological pancreas surgery, extensive resections of the liver and bile ducts are technically more demanding than a simple transplantation'', says Assistant Professor Petrović and adds that ''when a liver transplant is primary or when it is the first transplant, it isn't that demanding. When the technique and the routine are mastered, it is easier than complex oncological procedures.''

Besides, oncological procedures last much longer than transplants, and they often require a resection of blood vessels and the neighboring organs. Therefore, they can be both physically and mentally burdening to the surgeon. Liver operations or liver resections last at least 4 hours, and sometimes even twice as long.

The number of cancer patients is growing

Assistant Professor Petrović claims that the biggest problem is the fact that the prognosis in oncology pathology is very unrewarding. 'Therefore, after informing the patient of their diagnosis, the most important thing is to familiarize them with survival statistics and the quality of life after surgery. And that, I have to admit, is often the most difficult part of our job.''

Based on his own experience, Assistant Professor Petrović claims that the worst thing to do is to bond with patients. ‘’Such close contact and a possible bad outcome drain a doctor as a person.’’ After seeing the medical report, he conveys the information to the patient, a with their consent, also to the rest of their family. ‘’All of this is often very uncomfortable and unrewarding.’’

The number of cancer patients is increasing statistically, and what’s worse is that the patients keep arriving in the later stages of the disease when it is difficult to achieve something. Therefore, it is not surprising that, in most cases, the patients who are diagnosed with tumors often see it as a passing of a death sentence.

Pancreatic tumor is one of the worst

One of the worst forms of tumor is pancreatic tumor. ‘’ The problem is that in a large percentage of primary pancreatic tumors, which are locally operable, there are already micro metastases at the surgical stage that become apparent a few months after surgery,’’ describes Assistant Professor Petrović.

However, tumors of the trunk and tail of the pancreas are the most insidious ones, because they are late onset. While diagnosing pancreatic cancer, says Assistant Professor Petrović, in 85 percent of the cases it has already spread into local structures or it has metastasized into the liver and lungs. ‘’These tumors often don’t have symptoms or they are developed late, when the metastases have already spread. The statistics on radical surgery for pancreatic head tumors are unrelenting: in up to 40 percent of the cases, post-operative complications arise.

He is especially proud of radical procedures on pancreas tumor

Assistant Professor Petrović doesn’t hide how proud he is of the radical procedures for pancreatic tumors on patients who have been rejected by other institutions where they have been declared inoperable. Recently, one patient’s entire pancreas was removed, and a so-called total pancreatectomy was performed due to cancer.

‘’We cut the portal vein along with the tumor and sewed that defect primarily, and we cleared the arteries of tumor infiltration. It was, if nothing else, a good palliative procedure as the patient was in pain before surgery. These tumors, in fact, infiltrate the retroperitoneal nerves and cause excruciating pain. We have ridden the patient of the pain, and time will tell how much we have helped her in the long term, in terms of the length of survival,’’ says associate professor Petrović.

In borderline surgical pancreatic tumors, radical surgery improves the patient's quality of life, and whether it helps survival depends on the biology of the tumor. ‘’Unfortunately, there is no way to control or predict whether someone will soon develop metastases. The problem is, with current diagnostics, you can't see micro metastases.’’

A lot is expected from the genetic profiling of tumors

A lot is expected, he says, from the genetic profiling of hepatobiliary tract tumors. ‘Molecular biology methods could be used to define what kind of biological subtype of pancreatic ductal adenocarcinoma it is, and then according to that a targeted oncological and surgical therapy would be determined. Then it might become evident that surgical treatment isn’t an option at all, even though it might seem like the optimal method of treatment in the beginning.’’

Smart drugs are really helpful in treating tumor, while radiosurgery is also an option. ‘’It’s a targeted radiotherapy of the tumor, but in my opinion, it should be limited to those tumors which aren’t surgically radically operable. In practice, it is confirmed that radical surgical tumor removal, if possible, brings the most benefits for the patients.’’

An emphasis during treatment, claims Assistant Professor Petrović, should also be put on multidisciplinarity. ‘’We also rely on sophisticated oncological therapy before and after surgery, as well as diagnostics which could make a difference between the ones who will benefit from the surgery, and the ones who won’t.’’

The number of patients with colon cancer is also increasing

The number of patients with colon cancer is also on the rise, which we can, for the most part attribute to our lifestyle and diet, according to Assistant Professor Petrović. ‘’When discovered in the early stage, the prognosis is satisfactory and good, but it is bad when the tumor has spread into the lymph nodes or distant metastases.’’ A fortunate circumstance, is, he says, that digestive tract cancer can be diagnosed early by colonoscopy and gastroscopy or when anemia and bleedings occur in the early stage. ‘’Digestive tract endoscopy is then extremely important.’’

As opposed to colon cancer, the prognoses are much worse for pancreatic cancer and ductal adenocarcinoma. It occurs most often on the head of the pancreas; it is somewhat more common in men than with women. With a radical surgical procedure, when the situation is ideal and when the metastases haven’t expanded to the lymph nodes, a median survival of 24 to 36 months can be ensured.

An oncological multidisciplinary team decides on the treatment methods for each patient

An oncological multidisciplinary team decides on the type of treatment each patient will receive. The team consists of specialists of various profiles: surgeons, gastroenterologists, radiologists and oncologists. They decide whether the patient should receive cancer treatment first and then surgery, or whether surgery should be performed immediately.

Sometimes, a surgical procedure is preceded by chemo or radio therapy which improves survival after a surgical treatment.

In our country, the economics of surgery or crude statistics, aren't that important, like in the USA for example, says Assistant Professor Petrović. ''If we think we can help a patient, then we do everything in our power to do so, regardless of the treatment costs. We present the patient with all the possible risks, but also with the possibilities of a good outcome. Whenever a procedure is risky, if there is a chance of improving the quality of life or extending the lifespan, we will always try to help.''

Student interest in surgery is declining

For a surgeon, he says, dexterity, experience, number of surgeries, good education as well as equanimity and theoretical knowledge are immensely important. ''It is also important to be prepared to take risks because without doing so, you won't be a successful surgeon. It is especially important that a surgeon doesn't succumb to panic in stressful situations, because then the anxiety spreads to others. It all depends on the surgeon, the more experience they have, the less nervous they are,'' says Assistant Professor Petrović.

He also revealed an interesting fact: medical student's interest in surgery, and especially abdominal surgery is drastically declining. ''When I applied for my residency in 2001, there were about 30 applicants. Today, there are merely a dozen. I believe the reason for this is that it is easier to achieve a good quality of life doing other jobs. Surgery is both physically and mentally demanding, it upsets a person, when complications arise one doesn't sleep for days, so it is avoided by many medical students. ''

As an Assistant Professor at the Faculty of Medicine, he noticed a big gap between his generation at university and current students. ''They are a lot more liberal, open, not just the students, but the specialists too. They know all about their rights and they are conscious; the trend of liberalization is definitely present. But they don't respect authority as much as we did.

Hierarchy in medicine is crucial, without it there is no serious surgery, one must know who is in charge.''

There are more and more women in abdominal surgery

As in other areas of medicine, there are more and more women in abdominal surgery. He adds, that UHC Rebro does not suffer from surgeons leaving to go abroad as some other hospitals.

''Nurses are leaving more often, but also arriving more often than surgeons. Luckily, we have veteran nurses who have been with us for years.'' Regarding the equipment, Assistant Professor Petrović says that in the current economic situation in the country, they are very well equipped and that they don't have problems with materials and medicine. ''Surgery is the smallest consumer at Rebro, especially after comparing it to, for example, hematological or oncological therapy which are enormously expensive.''

At the end of the conversation, we learned another interesting fact which illustrates Assistant Professor Petrović's willpower and persistence. ''Every workday, I get up at 5 AM and go the gym regularly, and I also enjoy mountain biking as well as skiing.''

5.3. Commentary and analysis

Because this is a text that encompasses a plethora of medical terms, I thought it would be very difficult to translate. But, similar to the previous text, which had scientific terms, most, if not all of the medical terms were not that difficult to translate, because of the previously mentioned Latin origin. Other than this, many sentences in the text were extremely long, so I have contemplated many times whether I should keep the long sentences while translating, or whether I should split them into shorter ones.

In the beginning of the text, I encountered a sentence which I thought would be difficult and problematic to translate: 'Šira javnost prvi puta je čula za docenta dr. Igora Petrovića, iz Zavoda za hepatobilijarnu kirurgiju i transplantaciju abdominalnih organa KBC-a Zagreb, nakon što su nedavno jednom pacijentu presađeni srca i jetra.' As soon as I read the medical terms, which I've never encountered before, I thought that I wouldn't be able to translate it well. But, after using an online translator, Glosbe, to see how it would translate the medical terms, and after seeing that it sounds practically the same in Croatian, I realised that it won't be a problem.

Other than the medical terms, I had to find out what the translation of KBC (Kliničko bolnički centar) is, which I've done by vising the official website of the hospital and found that the English version is 'University Hospital Centre'. In the end, the sentence looked like this after translation: 'The first time the general public has heard of assistant professor Igor Petrović, Ph.D., from the Institute for Hepatobiliary Surgery and Transplantation of Abdominal Organs of the University Hospital Centre Zagreb, after one patient recently had a heart and liver transplantation.' As we can see, the words 'hepatobiliary', 'transplantation', 'abdominal', 'organs' are similar, almost the same, in both English and Croatian.

The following sentence also contained many medical terms: 'Pacijent je imao metaboličku bolest, amiloidozu, patološko nakupljanje bjelančevina u srcu, bubrezima, jetri, koji su zbog toga bili ozbiljno oštećeni. Posljedica je bila teška kardiomiopatija, odnosno bolest srčanog mišića, što je posljedično dovelo do bolesti jetre. Sve je to pak izazvalo acites, nakupljanje slobodne tekućine u trbušnoj šupljini.' But, as the sentence mentioned previously, it wasn't that difficult to translate either. 'Metaboličku' became 'metabolic', 'amiloidozu' became 'amyloidosis', 'patološko' became 'pathological', 'kardiomiopatija' became 'cardiomyopathy', 'acites' became 'ascites'. In the end, the sentence was translated as: 'The patient had a metabolic disease, amyloidosis, a pathological accumulation of protein in the heart, kidneys and liver, seriously damaged as a result thereof. The consequence was a severe cardiomyopathy, i.e. disease of the heart muscle(s), which consequently led to a liver disease. All of this, however, caused ascites, an accumulation of free fluid in the abdominal cavity.'

A sentence which I have had trouble translating was: 'Prva znanja o transplantaciji jetre stekao je na Rebru, gdje se još od 1990. godine, s prekidima i različitom učestalošću, provodi transplantacija jetre u odraslih, a potom i dječja transplantacija jetre.' I had trouble mostly because I was not certain whether I should I keep the order od the words or should I change it to sound more natural in English. In the end, I decided to change the order of the words, and it sounded so: 'His first knowledge on liver transplants was acquired at Rebro, where liver transplants have been performed in adults since 1990, and afterwards in children, with interruptions and varying frequencies.'

In the following sentence, I didn't know how to order the words so as to convey the meaning in the best way: 'Osim toga danas se na internetu te na specijaliziranim kirurškim kanalima mogu vidjeti zahvati koji prikazuju nove tehnike, primjerice, na gušterači.' My first translation of this sentence was: 'Afterall, you can find procedures which show new techniques on the internet and on specialized surgical channels today, like pancreatography. This translation did

not sound right, because I felt like ‘the internet’ should be the subject of the sentence, so I’ve decided to change it to: ‘In addition, the Internet and specialized surgical channels now feature procedures that demonstrate new techniques, such as pancreatography.’

I have also had trouble with similar sentences, which contained no medical terms: ‘Vjerujem da je razlog tomu što se kvaliteta života može postići na lakši način, na drugim poslovima’, and: ‘Kao docent na Medicinskom fakultetu uočio je veliku razliku između generacija kad je on studirao medicinu i sadašnjih studenata’. At first, I translated them the following way: ‘I believe that is so because one can achieve a good quality of life in an easier way, doing other jobs’, and: ‘As an assistant professor at the Faculty of Medicine, he noticed a big difference between the generations when he studied medicine at university and current students.’ I thought that these translation were overly and unnecessarily long, so I have decided to cut some words out and make the sentences simpler: ‘I believe the reason for this is that it is easier to achieve a good quality of life, doing other jobs’, and: ‘As an assistant professor at the Faculty of Medicine, he noticed a big gap between his generation at university and current students.’

The first sentence of the final paragraph was a slightly troublesome: ‘Kao i u drugim dijelovima medicine tako je i u abdominalnoj kirurgiji sve više žena, a odlasci kirurga u inozemstvo, priča docent Petrović, na KBC Rebro nisu toliko veliki kao u nekim drugim bolnicama.’ I opted to divide it into two shorter sentences: ‘As in other areas of medicine, there are more and more women in abdominal surgery. He adds, that UHC Rebro does not suffer from surgeons leaving to go abroad as some other hospitals.’ Instead of my original translation: ‘As in other areas of medicine, there are more and more women in abdominal surgery, and the surgeons' move abroad, says associate professor Petrović, is not as large at UHC Rebro as in some other hospitals.’

6. CONCLUSION

The main aim of this B.A. thesis was to translate four texts of different styles and topics and to identify, discuss and solve the problems and difficulties which were encountered during the translation process. The process of translation is truly demanding and time-consuming, and requires great, profound and extensive knowledge of both the source language (SL) and target language (TL). It also requires detailed and thorough research because the translator has the task to successfully transfer the meaning from the SL to the TL, even when it seems impossible to find a translation equivalent for a particular term. The translator has to use every tool available to do so, because the target text needs to be understood by the target audience.

Translating these four texts was a time-consuming and demanding process, but nonetheless, I found it interesting and educational. I find that I have expanded both my vocabulary and my knowledge of the English language. I have purposely chosen texts which contain some difficult terms, such as medical, biological and architectural, as well as texts with plenty of idioms and phrases, in order to motivate myself to do more research and to improve my translating skills.

As a translator, I expect I will be translating to Croatian more commonly, because, even though I do not have a formal education, Croatian is my native language, so it is expected of me to have very good knowledge of it.

However, I found it slightly easier to translate from Croatian to English, simply because I sometimes fail to remember certain Croatian idioms and phrases, and that can result in very unnatural sounding sentences in Croatian. Because I have received a formal education in English, some English words and phrases come to mind more naturally, as well as English grammar and vocabulary. It can oftentimes happen that I cannot remember a Croatian equivalent for a certain word, and the English word comes to mind straight away. But, with more practice, I am sure that I will have no trouble translating in both languages.

7. APPENDICES

7.1. Appendix A

Notre Dame rises again

Three years after a devastating fire, the iconic Paris cathedral's restoration honors its medieval roots—and the once vilified architect who saved the church in the 1800s.

The fire in 1831 spared the Cathedral of Notre Dame itself. The rioters scrambled up the roof and toppled a giant iron cross; they shattered stained glass, took axes to a statue of Jesus, smashed one of the Virgin Mary. But they were really after the archbishop of Paris, who wasn't there—and so they sacked his palace, which stood south of the church, facing the Seine River. Then they set fire to it. The palace is gone now. A 250-foot-tall construction crane stands on that spot.

There's a drawing of the scene that night, February 14, 1831, viewed from the Quai de Montebello, across the Seine. It was made by Eugène-Emmanuel Viollet-le-Duc—the man who, 13 years later, would undertake a 20-year restoration of the cathedral. Viollet-le-Duc was only 17 when he witnessed the mob attack. In his hasty pencil sketch, agitated stick figures swarm the palace, hurling furniture and other valuables out the windows and into the river. Behind all that stands Notre Dame, then six centuries old.

In 1980, also at age 17, Philippe Villeneuve saw an exhibit about Viollet-le-Duc at the Grand Palais. He knew he wanted to be an architect—he was already building an elaborate model of Notre Dame—but he didn't know you could specialize in historic buildings. Today he's one of 35 "chief architects of historic monuments" in France, a profession most famously embodied by Viollet-le-Duc. Villeneuve has directed restoration work at Notre Dame since 2013, and with terrible urgency since the spring of 2019, when a fire ripped the top off the cathedral. The building has been stabilized at last; reconstruction is about to begin. In more ways than one, Villeneuve owes his current mission, the fight of his professional life, to his ingenious predecessor, Viollet-le-Duc.

"He invented the restoration of historic monuments," Villeneuve said. "That didn't happen before. Before, people repaired them, and they repaired them in the style of their day." Or they didn't repair them, and tore them down.

In 19th-century France, a government first established institutions to grapple systematically with a question that concerns us all: What part of the past is worth preserving and transmitting

to posterity? What duty do we owe the creations of our ancestors, what strength and stability do we draw from their presence—and when, on the contrary, do they become a lead weight, preventing us from projecting ourselves into the future, from creating a world of our own? The question is one each of us faces in microcosm, in our work and in our life. Each of us has a service des monuments historiques in our head, struggling to decide what to hold on to and what to toss, which change to resist and which to embrace. It's just we're often not very conscious of it. And we're often not conscious of our stake in the preservation decisions made by governments—of how old buildings touch us. Until they are threatened.

In its day, Notre Dame was revolutionary. It was built in the late 12th and 13th centuries, as France was becoming a nation, and Paris, its capital, the largest city in Europe. Notre Dame was the first grand masterpiece of a new French architecture—one in which pointed arches and flying buttresses allowed the walls to be soaring and thin, the windows to be enormous, and the light to flood in. Jealous Italians named it "Gothic," by which they meant "barbarian," but the French style conquered Europe. In the tall light, people felt the presence of God.

By the early 19th century, though, Notre Dame was in trouble. Decades of attack and neglect, beginning even before the Revolution of 1789, had left it dangerously dilapidated. Victor Hugo was so incensed, he set an entire novel around the cathedral, folding a polemic on abuse of history into a potboiler about a repressed priest, a hunchbacked bell ringer, and the girl they both desired. Notre-Dame de Paris was published in 1831, the month after the archbishop's palace was burned down. All over France, ancient church buildings seized during the revolution were being plundered for the stones. Hugo helped start a movement that said, Enough. Viollet-le-Duc was swept up in it.

He saved Notre Dame. He rebuilt buttresses and stained glass, replaced statues demolished by revolutionaries, and added more: The cathedral's beloved grotesques are his. And when he built a new wooden spire, 50 feet taller than the medieval original, he added larger-than-life copper statues of the Twelve Apostles in steps up its base. Eleven looked outward, watching over the city; the 12th was St. Thomas, the Apostle who doubted. Viollet-le-Duc gave Thomas his own face and had him gaze up at the spire, his masterwork. He was a nonbeliever who saved the queen of French cathedrals.

Now that church, a house of worship for more than 800 years, is being saved again. It's being saved after a half century in which the practice of Catholicism in France has collapsed, while the number of tourists has exploded. In Villeneuve's office behind the cathedral, in the second

story of a stack of modular containers, the desk faces a print of Viollet-le-Duc's 1843 drawing of the west front of Notre Dame. A trickle of congealed lead from the roof, melted by the 2019 fire, is wedged into a corner of the frame. Since the night of the fire, it has been Villeneuve's intention to rebuild the church exactly as Viollet-le-Duc left it, including the lead roof and the "forest" of massive oak timbers that supported it.

"We are restoring the restorer," he said.

A little before seven on the evening of April 15, 2019, as Villeneuve was racing from his home on the Atlantic coast to catch the last high-speed train for Paris, I was in a taxi crossing the Seine. The traffic was crawling. My wife looked out the window. "Is Notre Dame burning?" she asked. The patch of flickering orange on the roof made no sense. I'm sure they'll put it out soon, I muttered. Moments later we saw the flames shoot up the wooden spire and engulf it.

Everyone in France remembers where they were when Notre Dame burned that April night—in that way, though no one died, it's like 9/11. Bernard Hermann, a retired photographer, was in his garret on the Place du Petit Pont, facing the cathedral. A book of his, called Paris, km 00—on French maps, distances are measured from a zero point in front of Notre Dame—consists of photographs taken from his windows. "The drama of Notre Dame was for me the end of the world," Hermann said. "I was thunderstruck. I closed the curtains."

Jean-Michel Leniaud, a historian of architecture, was at a reception at the Palace of Versailles. He rushed back to Paris and watched the drama. "People were crying. People were praying. People were kneeling in the street," he said.

Six miles to the west, Faycal Aït Saïd, who now operates the crane that towers over the wounded cathedral, was finishing his shift on an even taller crane, building a new office tower. Alone in the sky at 425 feet, he saw the giant plume of smoke on the horizon, beginning to drift west.

By the time Marie-Hélène Didier, the culture ministry conservator responsible for Notre Dame, got through the firefighters' perimeter, most of the precious artifacts had already been extracted and placed in the yard. "It looked like a big flea market," she said. Late that night, she escorted some of the treasures in a city van to a vault at the Hôtel de Ville. The linen tunic of St. Louis, the 13th-century king and crusader, was on Didier's lap. Next to her, her boss held the Crown of Thorns.

President Emmanuel Macron was at the Élysée Palace, where he had just recorded a televised national address for that evening responding to the "yellow vests"—the protest movement

against his government. He canceled the speech and rushed to the cathedral. Notre Dame is "our history, our literature, our imagination … the epicenter of our life," he said, speaking into the TV cameras. "This cathedral, we will rebuild it, all of us together."

Dorothée Chaoui-Derieux, a conservator who oversees archaeological digs in Paris, read the news on Twitter as she made dinner for her three children. She'd never taken them to Notre Dame, she realized. It didn't occur to her that she'd be spending nearly every day for the next two years in the empty cathedral, sifting through debris—what she calls vestiges—that Notre Dame itself would become an archaeological site.

As the church was still burning, TV networks offered talking heads. "Stupidly, I stayed in front of the TV, even though I live in Paris and should have gone to see it," said Philippe Gourmain, a forestry expert. With rising fury, he heard pundits opine that the timber framework in Notre Dame's attic would never be rebuilt—that France lacked the oak trees and the savoir faire. Gourmain manages forests all over the country. By 11 p.m. he was on the phone with a friend at the National Forest Office, hatching a plan to collect the needed wood through donations.

Around that time, Villeneuve reached the parvis, the square in front of the cathedral; he'd been on the train and off-line when Viollet-le-Duc's spire collapsed. The next day, climbing the north tower to inspect the damage, he spotted the copper rooster that had perched on top of the spire. Sailing free, it had landed on a side roof. A photo in Le Parisien showed the beaming architect clutching the crumpled bird to his chest.

"When I arrived on the parvis, I was dead. Now I'm in a coma," he told me. "In rebuilding the cathedral, I'm rebuilding myself. I'll be better when it's finished." In September, with the reconstruction soon to begin, Villeneuve had a drawing of the spire tattooed onto his left arm, from the elbow to the wrist.

In the summer of 1998, a Columbia University art historian named Stephen Murray took me into the attic at Notre Dame. It was gloomy even in bright daytime. As we walked through the lattice of roughly hewn oak beams, the curved tops of the church's soaring limestone vaults spread like gray elephant backs beneath our feet. Dust pooled in the hollows. From below, inside the church, I'd never imagined this backstage world—the world of the cathedral builders. At the crossing of the transept and nave, I looked up into the intricate wood skeleton of the spire.

Last summer I stood once again at the same location. But this time I was on scaffolding, looking down into the giant hole the spire made when it crashed through the stone vaults. The top of it punched a second hole in the nave; a third formed at the north end of the transept. As the fire raged through the forest, triangular trusses of oak, 32 feet high, toppled like dominoes onto the vaults, and debris fell through the holes. At the crossing, charred wood and stone were piled around four feet high on the cathedral floor.

Within days of the fire, even as Macron was promising that Notre Dame would reopen in time for the Paris Summer Olympics in 2024, Chaoui-Derieux and her colleagues had decided that the debris couldn't simply be carted away. It was legally protected heritage material that would have to be sorted by professionals. Soon dozens of them descended on the church. The Research Laboratory for Historical Monuments sent the bulk of its 34-member staff, deputy director Thierry Zimmer told me.

Because the damaged vaults were still in danger of collapsing, the scientists used remote-controlled robots to collect the debris. Wearing respirators to keep out the lead dust, they sorted through the material in a side aisle, picking out anything that might inform the reconstruction or be of historical interest. Tree rings in the larger pieces of wood, for example, offer clues to the detailed construction sequence of the church.

"All that stuff we'd never gotten our hands on before," Zimmer said. "Now, unfortunately, it was in our hands." A small silver lining will be increased knowledge of the cathedral and the period in which it was built.

It took two years to get all the debris sorted and removed to a warehouse near Charles de Gaulle Airport. The stuff sprawls there over 25,000 square feet, on 20-foot-high shelving. The bits of wood too small to be studied, the tiny chunks of stone, the dust and ash—even that has been saved, for now, in hundreds of storage bags. It was grueling work, Chaoui-Derieux said—but exhilarating, a "human adventure" she doesn't expect to experience again.

While the floor of Notre Dame was being cleared, the walls and vaults had to be secured against caving in. An engineering study had found that without the lead roof and timbers weighing on them and tying them together, the walls were frighteningly vulnerable to wind; a mere 56-mile-an-hour gust could have toppled them. From 2019 through the summer of 2021, carpenters shored up flying buttresses and some of the vaults, nestling custom-fit, multi-ton wood braces

under each one. Meanwhile, rope technicians were dismantling, one steel tube at a time, the old scaffolding—Villeneuve had been about to renovate the spire when the fire struck. A sagging, tangled mess, it threatened to fall and further damage the church.

COVID shut the site down for two months in spring 2020. The pervasive lead dust had already shut it down for six weeks in 2019, after workplace inspectors decided that initial safety precautions were inadequate. Since then, a line of showers in the container that serves as a locker room has divided the site into dirty and clean domains. Workers repeatedly negotiate that border every day, stripping naked and changing into protective clothing to go to work, then doing the reverse—and showering and washing their hair—each time they leave, even for lunch. Visitors follow the same procedure. Disposable underwear and jumpsuits are provided.

Even Emmanuel Macron has submitted to this. I have that on good authority—that of the five-star general whom the president called out of retirement the day after the fire, asking him to manage the cathedral's reconstruction.

Jean-Louis Georgelin had come up through the infantry. He'd been chief military adviser to one president and chairman of the joint chiefs to another. Macron entrusted him with Notre Dame for two reasons, Georgelin said: The general is a devout Catholic, one who knows his psalms in Latin—he recited one for me—and he has the political savvy and authority to get the cathedral reopened by 2024. That will require navigating French bureaucracy. Georgelin presides over an établissement public, a public entity set up specifically to restore Notre Dame, using 840 million euros in donations, including 30 million from donors in the U.S.

Restoration projects normally are managed by the culture ministry. Some people from that milieu consider the general's involvement peculiar and the 2024 deadline unrealistic. Is it? I asked Georgelin. He cheerfully batted away the question.

"I see, monsieur, you have been contaminated by those who believe the president of the republic should not be interfering in the reconstruction of Notre Dame," he boomed. "You have been contaminated by the party of slowness." Georgelin is a good-humored alpha type, a man who, as he talks over you in a parade-ground voice and hazes you with satirical formalities, does it all with a self-aware grin.

The damage to the church, Georgelin said, is severe but contained. I'd been struck by that myself—by how untouched much of it seemed, when you looked past the scaffolding that now fills most of it. Marie-Hélène Didier was surprised too when she walked through on the day

after the fire, running her finger over the walls to check for soot. “Nothing was destroyed!” she exclaimed, meaning none of the treasures or valuable artworks. The modern altar at the crossing was crushed, but the iconic Virgin of Paris, a 14th-century stone statue, still stood a few feet away, dusty but unharmed, with rubble at her feet. At the monuments lab, Claudine Loisel, the stained-glass specialist, told me that just a few pieces of glass on three small panels had been knocked out by the tip of the spire. The rest were fine.

In all, the church lost its spire, its roof and rafters, and a few of its stone vaults. That’s plenty—but not too much to be fixed by 2024, Georgelin said.

Unlike most people I spoke to, he sometimes attended Mass at Notre Dame before the fire. On that dreadful evening, the general was at home in Paris, watching on TV and crying, “like everyone.” He heard people saying they wouldn’t live to see Notre Dame restored. That’s why the president’s promise to the nation was necessary, Georgelin said—and as for the five-year deadline, if Macron hadn’t set it, architects and other arty types would have stretched the work to 15. The general turned his eyes to the ceiling and emitted a tuneless whistle, to illustrate what head-in-the-clouds time-wasting looks like.

“**As for the chief architect** of historic monuments … I have already explained to him multiple times, and I will tell him again … that he should shut his trap.” That was Georgelin speaking about Philippe Villeneuve to a committee of the French National Assembly in November 2019.

The two men were probably doomed to clash. Georgelin is used to not taking guff as he gets things done. As a chief architect, Villeneuve is used to a lot of latitude. Georgelin wears suits and double-breasted blazers that conceal, one assumes, no tattoos. Villeneuve is an intellectual in jeans, rumpled jacket, and granny glasses. He’s an emotive man who personalizes the crisis and wears his heart on his sleeve, almost literally. He has good reason to feel the situation at Notre Dame intensely.

It’s not his first brush with such a disaster. “My career has been marked by fire,” he told me. On the day of his promotion to chief architect of historic monuments, in 1998, Villeneuve learned that a medieval church in his department, the Charente-Maritime, had been set ablaze by lightning. It became his first commission. On the day fire found Notre Dame, he’d been working at his other main project, the 15th-century town hall of La Rochelle—which also had been devastated earlier by fire, also as Villeneuve was restoring it. That happened in 2013, shortly before he got picked for Notre Dame.

No evidence has emerged connecting either fire to the restoration work. The Paris police have not released results of their investigation at Notre Dame; an electrical short circuit is a prime suspect. But Villeneuve still feels the burden of having to redeem the tragedy.

“He has risen to the occasion,” said Jacques Moulin, the chief architect who’s restoring the nearby Basilica of Saint-Denis. “He has been able to transcend himself. That’s a rare ability.” But it put him at cross-purposes with the president.

After the fire, Macron publicly encouraged something architecturally new at Notre Dame—a “contemporary gesture,” he called it. “We should have confidence in the builders of today,” he said, “and we should have confidence in ourselves.” Builders responded gleefully: Suggestions for glass roofs and crystal spires and spires of light poured in from all over the world. One architectural studio proposed a greenhouse on the roof. Another suggested replacing the roof with an open-air swimming pool.

Villeneuve wanted desperately to nip all this in the bud. He would not participate in building a modern spire, he said. That’s when Georgelin tried, a little clumsily, to shut him up. But the wacky proposals helped make Villeneuve’s case; everyone could agree the cathedral shouldn’t become an aboveground pool. By the summer of 2020 the general, the president, and the national heritage commission had all approved Villeneuve’s plan. Notre Dame is to be rebuilt as it was, in its “last known state”—the state it was left in by Viollet-le-Duc.

It was a triumph of orthodoxy: Rebuilding to the last known state is what French restorers generally do. The Venice Charter, created in 1964 at an international conference of specialists, codifies that approach, in which the goal of historical restoration is not the most beautiful building but the most “authentic” one—the one that preserves all its layers of history. The impulse sounds academic, but it’s also emotional. Rebuilding identically, especially after a disaster, is “a powerful symbolic act; it’s a cathartic act,” said Leniaud, the historian. “It’s the only way to grieve. It’s very important to grieve.”

The irony is that Viollet-le-Duc, who had watched Notre Dame be attacked, showed no such restraint (especially after the death of his partner, Jean-Baptiste Lassus, left him alone in charge). His goal was not to rebuild Notre Dame exactly as it was but to build the ideal cathedral. He completely redid some walls around the crossing because he didn’t like the way they’d been altered in the 13th century. He demolished the 18th-century sacristy and replaced

it with a neo-Gothic one. He honored Gothic architects by trying to become one—and with the spire, the consensus is, he outdid himself. With some other liberties he took, not so much.

For a century after his death, Viollet-le-Duc was vilified by the monuments establishment he himself had helped establish. “When I was a kid at architecture school, a restoration by Viollet-le-Duc meant a total mess,” Moulin said. At Notre Dame, Viollet-le-Duc painted decorative murals in all 24 side chapels; in the 1970s, the 12 chapels of the nave were scraped back to bare stone. But by then, the rehabilitation of the great man’s reputation was just about to begin—and the exhibition that 17-year-old Villeneuve saw in 1980 was a turning point. “All at once we went from a diabolical Viollet-le-Duc to a Viollet-le-Duc who is practically a saint,” Moulin said.

Today most French restorers wouldn’t think of undoing anything Viollet-le-Duc did. Moulin thinks that’s a shame. He believes in preserving history too—but trying to fix a building once and for all in its “last known state,” he said, amounts to declaring that history has ended for that building: “It’s the definition of death.” And it may not be what’s best for preservation. If the roof of your cathedral has just burned off, Moulin argued, it doesn’t make sense to rebuild the rafters out of wood.

That argument was heard—and dismissed—at Notre Dame. The forest and the spire will indeed be built of wood, though with more fireproofing and with fire-suppressing misters. The details are still being worked out.

In 2019, the fire raging through the oak timbers got so hot—almost certainly more than 1,400 degrees Fahrenheit—that it ate into the adjacent limestone walls and into the tops of some vaults. Two stone specialists at the monuments lab, geologist Lise Cadot-Leroux and conservation scientist Jean-Didier Mertz, trained as rope technicians so they could inspect the damage. Mertz showed me some foot-long cores they extracted from the two-foot-thick stones. The surface of some stones turned to powder, and fissures formed inside, causing as much as four inches to peel off. But most of the blocks appear to have remained thick enough to do their job, Mertz said. He and his colleagues developed a technique for sealing the fissures by injecting a lime slurry. For the stones that need replacing, scientists are searching for good matches north of Paris; the city has grown over the medieval quarries, which were then on its outskirts.

Most of the 507 tons of lead in the roof and spire simply melted and rained into the church, but the heat was intense enough to launch lead particles into the smoke. The danger from inhaling

lead that night, unless you were standing right by the fire, was “negligible,” said Jérôme Langrand, a doctor and toxicologist who directs the Paris poison center at the Lariboisière–Fernand-Widal hospital. The real danger with lead is that it will be ingested accidentally over time, especially by children, via contaminated dirt in parks or playgrounds or dust that settles inside homes. Alexander van Geen, a Columbia University scientist who walked around Paris spooning dirt samples into paper bags, estimated that about a ton of lead had fallen within a kilometer of the church.

But there’s no evidence it caused significant poisoning, Langrand said. He and his colleagues analyzed blood from 1,200 children in the affected area. They found concentrations above the “level of concern” in a little over one percent—about the same as in the French population at large (and much less than in the U.S.). In every case, moreover, an investigation revealed that the children routinely were exposed to other sources of lead. Many Paris balconies, for example, have lead floors.

Still, no amount of lead in the blood is considered safe, and lead roofs pollute the environment whenever they’re worked or rained on. In February 2021, a science advisory board to the health ministry, of which Langrand was a member, recommended that France ban lead in new roofs and that alternatives to its use in historical restoration be found. The Paris city council by then had voted to demand that Notre Dame not be reroofed in lead.

None of this has diminished Villeneuve’s determination. To be endangered by a lead roof on Notre Dame, both he and Georgelin insisted, children would have to climb onto it and lick it.

“Lead is an absolutely essential element in the construction,” Villeneuve argued. Sure, the Cathedral of Chartres has a copper roof—but copper turns green, and Paris roofs are gray. Most are zinc, but only lead could reproduce the spire and the sculpted ornamentation of Notre Dame’s roof. Lead already covers the Panthéon, the Invalides, and other monuments, Villeneuve said; why should the cathedral be the only victim of “the madness of these lead fundamentalists”? Rainwater running off the new roof will be captured and filtered.

Villeneuve also plans to rebuild the timber framework exactly as it was. It had two distinct parts. When Viollet-le-Duc rebuilt the spire, he replaced the framework of the transept, and not in a medieval way—the beams were cut at industrial sawmills. Villeneuve will do the same. Last winter, Gourmain coordinated the donation of 1,200 oaks from all around France. The

largest, oldest ones had been planted just before the French Revolution by royal foresters who were safeguarding the navy's supply of ship masts. Those trees will serve as the base of the spire.

The attic timbers of the nave and choir were different: They were mostly original, from the 13th century. In September 2020, a group called Carpenters Without Borders reconstructed one of the triangular trusses in front of the cathedral, to demonstrate the feasibility of rebuilding the framework the medieval way. François Calame, an ethnologist and carpenter who founded the group, took me to see that truss where it's now on display, outside a medieval fortress in Normandy called Château de Crèvecoeur. It consists of a dozen beams—each hand-hewn from a single oak, no more than a foot across.

Medieval carpenters worked their wood green, and so did Carpenters Without Borders. They followed the grain, keeping the heart at the center. That gave some of the beams a gentle curve, but it made them stronger. The trusses at Notre Dame stood for more than 800 years before their luck ran out.

Calame pulled from the trunk of his car the tool of choice: a doloire, a broadax with a head flared like a trumpet. He took a few skillful whacks at a log, then let me have a go. The ax, he warned, was sharp enough to inflict serious injury if aimed poorly, which seemed a distinct possibility. My first blows glanced off the log with an alarming clang, but then I landed a few. Thin wedges of fresh wood flew into the air.

In Calame's view, historical restoration should be about restoring lost skills as well as damaged buildings—and not just for the benefit of carpenters. The reason Notre Dame's "forest" left such an impression on people who saw it, he thinks, is that a message was passing across the centuries from the master artisans who made it.

"The framework was 800 years old. It's gone. But I think that if we rework it the way it was worked, in the same manner and with the same materials, the message can be transmitted," Calame said. "You'll be able to feel it."

Villeneuve was impressed by the demonstration by Carpenters Without Borders. To save time, he said, sawmills will trim the logs for the nave and choir, but the beams will be finished by hand with doloires. Construction of the spire will come first, however. Viollet-le-Duc had to

break a hole in the vaults so he could build his spire from the inside. Villeneuve has a head start: The hole is already there.

Maurice de Sully, the bishop of Paris who commissioned Notre Dame in 1163, was the son of peasants. While the spire strained toward heaven, Sully's aspirations were worldly as well: He was showing off his power to his rivals, as well as the king. The tower on the archbishop's palace looked like a castle battlement. The cathedral's west facade was even more massive.

"In the medieval city, it was completely dominant, crushing," said Bernard Fonquernie, who as chief architect restored the facade in the 1990s, removing decades of car exhaust and pigeon poop. I was living in France then and remember that rebirth—how the walls glowed when the scaffolding came down.

Construction of the cathedral was financed mostly by donations from ordinary people, said art historian Dany Sandron of the Sorbonne. Their experience of the church was not that of Catholic Mass-goers today. Milling about in the chairless nave, they couldn't see and could barely hear the services held by the resident canons, eight times a day, behind a wall in the choir. In the side chapels, chaplains whispered some 120 Masses a day, but those too weren't really for the living; they were for the affluent dead, who had endowed Masses in perpetuity in hopes of boosting their souls out of purgatory.

Nevertheless, ordinary people flocked to Notre Dame. They sometimes slept on the floor before an altar, dreaming of miraculous cures for painful diseases. Catholic faith was vital to most French people then. It isn't now.

"Notre Dame is not a museum," Patrick Chauvet, the cathedral's rector, insisted. Before the fire, some 3,000 people came to Mass on Sundays—but 10 to 12 million tourists visited each year. Many had scant knowledge of Christianity. "How can they be touched by the grace of this place?" Chauvet asked. "How can the beauty of this place perhaps at least interrogate them on the meaning of their lives?"

The plan, he said, is to re-curate the visit. When the church reopens, visitors will be ushered in a new loop past redesigned side chapels. Proceeding from north to south—from darkness to light—they'll encounter first the Old Testament, then the New, so as to "enter progressively into the mystery of God," Chauvet said.

Will that succeed? Thanks to the huge restoration budget, the cathedral should at least be looking sharp. Work that ordinarily would have stretched over decades is planned for the next

three years. The entire inside of the church, including all the chapels and paintings and most of the stained glass, will be cleaned—a sparkling rebirth. If, as Georgelin thinks, “the beauty of Gothic architecture is one of the best proofs of the existence of God,” then God will have risen to fight another day in France. The fire won’t have been for nothing.

That April evening, my wife and I were with old friends on their first trip to Paris. After dinner on the Right Bank, we decided to walk back to where we were staying on the Left. The banks of the Seine were lined with people watching Notre Dame burn. Crossing the Île Saint-Louis, we stepped over a hose the firefighters were laying to pump water from the river. On the Pont de la Tournelle, we stopped near an impromptu choir, softly singing hymns to Our Lady. I’ve admired that view, along the Seine toward the apse of Notre Dame, dozens of times. I can’t imagine what it would be like for it to be gone forever.

“It was beautiful—one must stress the beauty of the fire,” said Leniaud. “It was magnificent. But once it’s beautiful, afterward it’s ugly. There’s only the ruin. At first, there’s only blackness, darkness, death.” Until it comes back to life again, as it must.

7.2. Appendix B

Earth has lost and gained many oceans. Here's where a new one might appear next.

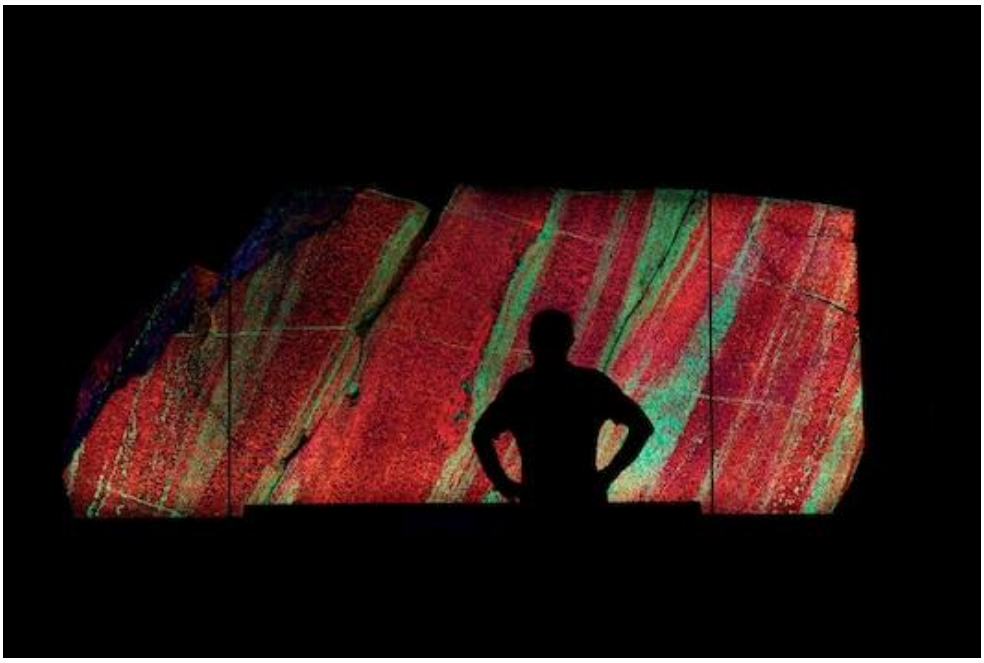
Geologic clues from our planet’s distant past reveal that today’s coastlines won’t last forever—but others will arise to take their place.

In a darkened room at the American Museum of Natural History in New York, a wall of unassuming stone stretches nearly to the ceiling. At first glance, it looks like a slab destined for a kitchen island or countertop, with black, white, and pink speckles mixing in bands of minerals that stretch far above my head. But then the display light flicks from white to black, and the 10-ton rock glows neon orange and green.

“You cannot help but drop your jaw," says George Harlow, the curator of the museum's newly renovated Mignone Halls of Gems and Minerals, where the rock stands.

The stunning vibrancy betrays the minerals' uniqueness: They formed on the bottom of a now-vanished ocean some 1.2 billion years ago, at a time when spindles of algae smaller than rice were among the largest forms of life. In this ancient ocean, metal-rich particulates burbled up from hydrothermal vents and settled to the seafloor in layers, creating a particular mix of elements that now fluoresce when exposed to ultraviolet light.

The rocks are a vivid reminder of just how much our oceans have changed over billions of years of history—driven by the planet’s ever-shifting network of tectonic plates. These shifts ripple like falling dominoes through geologic, atmospheric, and biological systems, influencing everything from the diversity of Earth’s minerals to the paths of ocean currents and atmospheric flow. And all of this influences life as we know it today.



"The changes in the entire Earth system that take place as part of that changing geography are profound," says Shanan Peters, a geoscientist at the University of Wisconsin-Madison, who specializes in the co-evolution of life and Earth's systems.

Preserved seafloor slabs such as this one on display, along with a slew of other geologic clues, are helping scientists recreate the tangled history of oceans lost to time—the Iapetus, Rheic, Tethys, Panthalassic, Ural, and more. Just like these ancient bodies of water, our modern oceans will also eventually close, and others will form anew.

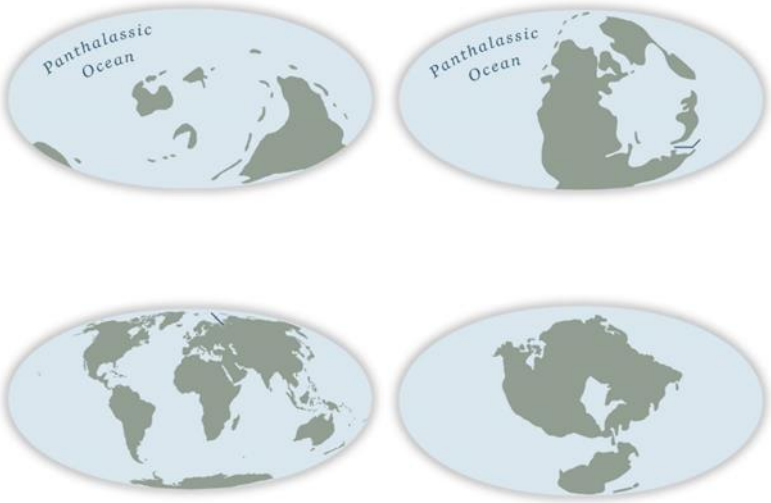
As Harlow simply puts it: "Things haven't stopped."

Clues etched in the seafloor

Our planet’s ever-shifting tectonic plates not only raise mountains and carve out valleys, but they also send the oceans opening and closing in cycles—"almost like an accordion," says Andrew Merdith, a tectonic modeler at the University of Leeds.

The movement is partly driven by subduction zones, in which one plate plunges beneath another. This action recycles the seafloor into the bowels of our planet and tugs along the land behind, narrowing the gaps between continents.

See Earth’s Changing Face



The slab of rock at the American Museum of Natural History, for example, hails from Ogdensburg, New Jersey, and was preserved during an ancient collision between the predecessor of North America and another ancient continent. The smashup obliterated the ocean between the landmasses, baking the layered seafloor sediments at high temperatures and pressures into the rock that stands today.

Yet the few bits of ancient seafloor preserved on dry land, such as the New Jersey rocks or a chunk of the mantle exposed in Maryland, can only give small hints about shifting oceans through time. To understand these movements better, some scientists turn to a record etched into the seafloor: magnetic minerals.

The birth of oceanic plates takes place along the longest mountain range in the world: an underwater chain known as the mid-ocean ridge. Snaking some 40,390 miles around our planet, the ridge marks where tectonic plates pull apart and hot rock from the mantle wells upward to fill the void. As this molten rock cools, some of its minerals align with the planet's magnetic field, creating a geologic barcode along the seafloor that adds new lines every time the field flips. Scientists can use these barcodes to track our shape-shifting oceans through time.

Ghosts of oceans past

The magnetic record, however, is imperfect: "The further we go back in time, the less and less oceanic rocks we have to deal with," says Grace Shephard, geophysicist, and expert in plate tectonic reconstructions at the University of Oslo. Except for a small swath of rock underlying the Mediterranean—which is a remarkable 340 million years old—much of the seafloor dates back a mere 100 million years ago, and the majority is younger than 200 million years old.

Scientists, however, have found a way to identify the floors of vanished seas that have sunk into Earth's mantle and are now hiding in an oceanic graveyard.

The method involves looking at the speeds of seismic waves from earthquakes rippling through the planet. Lost bits of the ocean floor can remain relatively cool for some 250 million years or so, and seismic signals differ when passing through cold slabs versus Earth's sizzling innards.

"It's always been a black box below our feet," explains Douwe van Hinsbergen, a plate tectonics specialist at Utrecht University in the Netherlands. But now seismic analyses allow scientists to study these ancient slabs and turn back the geologic clock, unwinding the subterranean forces that drive our world. These ghostly remains of seafloor lurk under nearly every continent, and van Hinsbergen and his colleagues cataloged almost a hundred in their so-called Atlas of the Underworld.

Among the oldest bits are remnants of oceanic plates up to about 250 million years old, which now sit at the boundary between mantle and core. That includes the Paleo-Tethys Ocean that once washed onto the shores of Gondwana, a supercontinent mostly made up of what is now South America, Africa, India, Arabia, Australia, and Antarctica.

Putting together these lost bits of seafloor, magnetic barcodes, and a slew of other geologic clues allowed a team of scientists to craft a stunning reconstruction of a billion years of our planet's past.

Merdith, one of the model's architects, notes that it's not the final word on Earth's early form, which may continue to shift as more data emerges. But playing the video of this dance of continents and oceans underscores the mesmerizing nature of our planet's shape-shifting surface.

"It's all part of the global puzzle," Shephard says.

Ripples through the habitats of Earth

As oceans open and close and continents drift across the planet, the transforming environments set the stage for life’s transformations. The formation of a new ocean, for example, can be a boon for biodiversity, as seen during a spike that occurred when Pangea broke apart, according to work from Peters and his colleagues.

Pangea contained the ancestral groups of all major terrestrial creatures today, Peters explains. After the supercontinent fractured into bits, land animals evolved into a diversity of colors, sizes, and lifestyles on their isolated patches. New oceanic circulation paths also carried moisture to continental interiors, wettening previously desiccated belts. Meanwhile, fresh swaths of shallow sunlit waters opened along new continental shelves, where marine life thrives.

"Those shelf edges are prime real estate if you're a clam or fish or something like that," Peters says. When Pangea broke apart, life on Earth boomed.

Even small tectonic shifts can have drastic impacts on the surface world. One particularly startling example is the formation of the Isthmus of Panama, a sliver of land that bridges North and South America, Peters explains. Water streamed from the Atlantic to the Pacific through this oceanic artery before about 20 million years ago. But as the Pacific plate plunged under the Caribbean plate, it raised the seafloor and sent underwater volcanoes charging to the surface.

The watery connection between oceans began to narrow and eventually was cut off entirely. The change sent warm waters careening northward in a current now known as the Gulf Stream, which drove up temperatures in northwest Europe, imparting a relatively balmy climate in the region, despite it being a similar distance north of the Equator as chilly sections of Canada.

The change also set the stage for the modern conveyor belt of ocean currents, which controls storm patterns, nutrient flow, and more. "The closure of the Isthmus of Panama had a huge effect," Peters says.

Oceans yet to come

Many more world-changing tectonic shifts lie in our planet's future. Some 250 million years from now, Earth’s landmasses might all converge once more into a supercontinent: Pangea Ultima. In this potential scenario, crafted by Christopher Scotese, director of the PALEOMAP Project, the Atlantic Ocean nearly closes and is reduced to a modest inland sea.

But the geologic future remains uncertain. Perhaps just the opposite could happen and the Pacific Ocean closes, forming a supercontinent on the opposite side of the world dubbed Novopangea. Still other models suggest some combination of changes could cause the Atlantic and the Pacific to close as new oceans are born in Asia.

Whatever scenario lies in our distant future, tectonic changes are already afoot. Scientists believe Earth’s next ocean could form in the East African Rift Zone, where a rising plume of searing hot rocks is slowly forcing apart a swath of land along the continent’s eastern coast, explains Cynthia Ebinger, a geophysicist at Tulane University who has conducted extensive research in the region.

This splitting has very real consequences today, as revealed by the abundance of volcanism in this part of the world—including a devastating eruption of Mount Nyiragongo in the Democratic Republic of the Congo that recently displaced up to 400,000 people and killed at least 32. Another volcano, on the coast of Eritrea, is having a different impact: It's keeping the Red Sea at bay, protecting patches of northeastern Ethiopia that lie below sea level from floods, Ebinger says. A small ocean once formed in this region, and while the water has long since dried up, Earth's shifting plates may eventually unleash fresh floods.

While tectonics has been a key driver of our planet's geologic past and future, a different powerful force is mucking with Earth's processes today: us. Humans pump planet-warming gasses into the skies at unprecedented rates, altering oceanic and atmospheric circulation with deadly consequences. Humans are also mixing up ecosystems through importation and travel like never before.

"That’s a process the Earth has never seen before, ever. Not once," Peters says.

The age of humans is only a blip in geologic time, but our actions promise to leave indelible marks on the world, particularly the mixing of the biosphere, Peters says.

"It’ll be present in every organism effectively that exists in the future,” he says, “in the same way that Pangea exists in every organism present, essentially, on the Earth today."

7.3. Appendix C

Egipat putovanje i krstarenje Nilom od Asuana do Luksora 2023

EGIPAT I KRSTARENJE NILOM U STUDENOM 2023.

ALEKSANDRIJA - KAIRO I PIRAMIDE U GIZI - KRSTARENJE NILOM OD ASUANA DO LUKSORA - HURGADA

Datum putovanja: 14. - 22.11.2023.

Putovanje Egiptom, jednom od najatraktivnijih zemalja svijeta, za turiste je poput putovanja muzejom na otvorenom koji postojano, tisućljećima odolijeva vremenu i zaboravu. Kad vam se čini da ste vidjeli i doživjeli nešto neponovljivo, već sljedeća legendarna znamenitost učinit će vam se još atraktivnijom te će vam ovo putovanje ispuniti nizom uzbudljivih iskustava koja se nižu jedno za drugim. Putovanje započinje na mediteranskoj obali u Aleksandriji, slijede velike piramide u Gizi i grad Kairo, zatim krstarenje Nilom uz obilazak zadivljujućih arheoloških nalazišta, a završava u ljetovalištu Hurgada na Crvenom moru. Pustinjski krajolici, povijesna mističnost, ali i sadašnji život stanovnika ostaju dugo u uspomenama i nakon povratka u svakodnevicu.

Program putovanja:

1. dan ZAGREB - ISTANBUL - ALEKSANDRIJA

Sastanak sudionika putovanja u zračnoj luci Franjo Tuđman u Zagrebu u 18.00 sati kod šaltera središnjih informacija. Preuzimanje putnih dokumenta i osnovnih informacija od strane pratitelja putovanja te prijava na let TK 1056 s polaskom u 20.00. Slijetanje u zračnu luku u Istanbulu u 00.10 po lokalnom vremenu.

2. dan ALEKSANDRIJA - KAIRO

Nastavak putovanja letom TK 696 za Aleksandriju u 01.35 s dolaskom u 02.50. Carinske formalnosti, preuzimanje prtljage te transfer u hotel na kraće noćenje i doručak. Razgledavanje grada. Smještena uz mediteransku obalu, Aleksandrija je drugi po veličini egipatski grad. Osnovao ju je Aleksandar Veliki i bila je važno središte helenističke civilizacije. Arhitektura,

kultura i bogatstvo grada nekoć su bili konkurenti Ateni i Rimu. Razgledavanje grada uz obilazak katedrale sv. Marka, obrambene tvrđave Qaitbey iz 15. st. odakle se pruža lijep pogled na grad i šetnice Cornishe te kratko zaustavljanje uz novu knjižnicu Biblioteca Alexandrina. Obilazak katakombi Kom el-Shuqafa, velike nekropole iz drugog stoljeća. Nekropola ima mješavinu rimskih, helenističkih i faraonskih umjetničkih elemenata koji se vide na slikama i u stilu izrade kipova, pogrebnih predmeta i samih grobnica. Slijedi razgledavanje arheološkog lokaliteta i ostataka hrama Serapeuma iz 3. st. Tijekom dana ručak u restoranu. U popodnevnim satima polazak prema Kairu. Po dolasku smještaj u hotel, večera i noćenje.

3. dan KAIRO I PIRAMIDE U GIZI

Doručak. Odlazak u Gizu nedaleko Kaira i obilazak legendarnih piramida, remek djela graditelja iz davnih vremena; sigurno su jedna od prvih slika koje vam padnu na pamet kad se spominje Egipat. Veličanstvene Keopsova, Kefrenova i Mikerinova piramida su od davnina smatrane jednim od sedam čuda antike, a i danas su ove monumentalne i zagonetne konstrukcije među najpoznatijim svjetskim građevinama. Tu je i legendarna Sfinga, skulptura s tijelom lava i ljudskom glavom, jedan od najvećih kipova na svijetu isklesanih iz jedne stijene, visine 22 m i dužine 73 m. Povratak u Kairo, najveći grad u Africi. Posjet Egipatskom nacionalnom muzeju koji sadrži veliku zbirku predmeta s brojnih arheoloških nalazišta diljem zemlje, između ostalog Tutankamonovu zlatnu masku i sarkofag. Ručak tijekom dana. Poslijepodne odlazak u stari dio grada, na čuvenu tržnicu Khan El Khalili gdje možete kupiti gotovo sve. U ranim večernjim satima transfer na željezničku stanicu i smještaj u kabine vlaka na relaciji Kairo-Asuan. Večera i noćenje u vlaku, noćna vožnja do Asuana.

4. dan ASUAN

Doručak. Silazak iz vlaka i nastavak putovanja autobusom. Obilazak drevnog asuanskog kamenoloma u kojem su klesani obelisci te zatim rijekom Nil prevoženi do hramova. Može se vidjeti nedovršeni obelisk od 41 m no još uvijek je zagonetka kako su i kojim alatima u ta davna vremena klesari obrađivali ogromne granitne stijene. Razgledavanje Asuanske brane

visoke preko 100 m i druge po veličini u svijetu. Slijedi smještaj u kabine na brodu 5* kojim će se tri dana ploviti Nilom. Ručak i odmor na brodu. U popodnevnim satima fakultativno izlet u hram Philae posvećen božici Izidi. Hram je premješten na novu lokaciju kako ne bi bio potopljen kad se gradila Asuanska brana. Nakon razgledavanja fakultativno izlet u Nubijsko selo gdje se može vidjeti tradicionalni način života. Povratak na brod, večera i noćenje.

5. dan ASUAN - KOM OMBO - EDFU / Abu Simbel

Fakultativno izlet u Abu Simbel. Rani polazak i vožnja kroz pustinjski krajolik u svitanje do Abu Simbela i hramova posvećenih Ramzesu II. i njegovoj ženi Nefertari. Monumentalni ulaz naglašavaju četiri faraonove skulpture visoke 18 m. Ramzesove skulpture su druge po veličini u Egiptu, veća je jedino Sfinga. Povratak na brod. Ručak te početak plovidbe legendarnom velikom rijekom koja znači život za ovaj kraj i stvara bujnu dolinu u srcu pustinje. Poslijepodne dolazak do hrama Kom Ombo na obali Nila, jedinog hrama koji je posvećen dvojici bogova: bogu Sobeku i bogu Horusu. Obnovljen je i jedan je od najljepših hramova ptolomejske ere. Povratak na brod, plovidba za Edfu. Večera i noćenje na brodu.

6. dan EDFU - LUKSOR

Doručak. Silazak s broda da bi se obišao Horusov hram u Edfuu, jedan od najbolje očuvanih hramova u Egiptu s mnoštvom crteža i hijeroglifa. Hram je bio gotovo dvjesto godina zatrpan pijeskom, što je pomoglo očuvanju građevine, a njegove brojne zidne rezbarije pružile su povjesničarima vrijedne informacije o tom razdoblju egipatske povijesti.

Nastavak plovidbe preko ustave u Esni prema Luxoru. Po dolasku obilazak velebnog staroegipatskog hramskog kompleksa u Luksoru (drevnoj Tebi) sagrađenog oko 1400. pr.n.e. koji je bio vrlo značajan u tadašnjim vremenima. Smatra se da su u ovom hramu krunjeni egipatski faraoni. Tijekom rimskog razdoblja pretvoren je u utvrdu u kojoj je bilo sjedište rimske vlasti. Hram je povezan s drugim velikim hramom Karnak Alejom sfingi koje su nedavno obnovljene i kojom se može prošetati. Povratak na brod na večeru.

7. dan DOLINA KRALJEVA - KARNAK - HURGADA

Doručak i odjava s broda. Odlazak u Dolinu kraljeva gdje se nalaze 63 kraljevske grobnice iz perioda od 1550. do 1070. godine pr.n.e. Za razliku od faraona iz doba Starog kraljevstva, koji su pokapani u piramidama, faraoni od XVIII. do XX. dinastije pokapani su u Dolini kraljeva, u podzemnim grobnicama, duboko ukopanim u kamene litice. Razlikuju se jedna od druge no sve su bile bogato ukrašene i oslikane. Mnoge grobnice su oštećene i opljačkane od strane lovaca na blago te ih se danas nastoji što više obnoviti. Slijedi razgledavanje kaskadnoga hrama kraljice Hatšepsut ispod stijena iste boje kao i samo zdanje te se čini kao da je sve jedna cjelina, a zatim Memnonovih kolosa, dvaju velikih kamenih kipova u sjedećem položaju iz 14. st. pr.n.e. Odlazak do Karnaka, najvećeg drevnog hramskog kompleksa u svijetu posvećenog bogu Amonu, sjedišta religijskog života u drevna vremena. Hramski prostor se gradio i dograđivao

više od tisuću godina. U hram se ulazi kroz Aleju sfingi, a u unutrašnjosti se mogu vidjeti veličanstvene dvorane ukrašene reljefima, kipovi, prostrana dvorišta i ogromni stupovi. Neki su visoki i do 24 m, promjera 3,5 m. Nakon svih razgledavanja i ručka tijekom dana, polazak prema poznatom ljetovalištu na Crvenom moru, Hurgadi. Po dolasku smještaj u hotel, večera i noćenje.

8. dan HURGADA

Boravak u Hurgadi na bazi all Inclusive usluge. Slobodan dan za kupanje, aktivnosti po želji ili fakultativno izlet brodom.

9. dan HURGADA - ISTANBUL - ZAGREB

Rano ustajanje i transfer u zračnu luku. Prijava na let TK 703 s polaskom iz Hurgade u 03.45 i slijetanjem u Istanbulu u 07.45.

Transfer u grad. U pratnji vodiča razgled Istanbula te slobodno vrijeme prije povratka na aerodrom. Nastavak putovanja letom TK 1055 u 19.00 sati i dolaskom u Zagreb u 19.10.

Cijena po osobi:

First minute: 1.560 € (11.746,80 KN)

Redovna cijena: 1.590 € (11.972,70 KN)

Cijena obuhvaća:

- prijevoz zrakoplovom prema programu u ekonomskoj klasi
- aerodromske takse
- 1 noćenje s doručkom u hotelu u Aleksandriji 4*/ 5*
- 1 polupansion u hotelu Kairu 5*
- 2 noćenja u Hurgadi u hotelu 5* na bazi all inclusive usluge
- 3 puna pansiona na krstarenju Nilom na brodu 5*
- 1 polupansion u vlaku Kairo - Asuan
- 3 dodatna ručka u lokalnim restoranima

- vodstvo putovanja na hrvatskom jeziku
- luslugu okalnog vodiča na engleskom jeziku
- sve prijevoze prema programu klimatiziranim turističkim autobusom
- razgledavanje prema programu i sve ulaznice za lokalitete koji se posjećuju
- troškove transfera i vodiča za razgled Istanbula na dan povratka
- troškove organizacije putovanja

U cijenu nije uračunato:

- doplata za jednokrevetnu sobu / brodsku kabinu i vlak 350 € (2.635,50 KN)
- troškovi ulazne vize 25 $ koja se ishodi na aerodromu po dolasku u Egipat i plaća na licu mjesta
- napojnice lokalnom vodiču i vozaču (plaćanje na licu mjesta oko 50 $ za cijelo putovanje)
- putno osiguranje

Fakultativno:

- izlet u Abu Simbel 125 € po osobi / minimum 10 osoba
- hram Philae 35 € po osobi
- Nubijsko selo 40 € po osobi

Izlete je potrebno najaviti unaprijed, a plaćanje je na licu mjesta.

Minimalni broj putnika u grupi: 20

Napomene:

- Navedena cijena je za smještaj u dvokrevetnim ili trokrevetnim sobama.
- U vlaku nema trokrevetnih kupea. Ako su tri osobe koristi se dvokrevetni i jednokrevetni s tim da je doplata za jednokrevetni kupe 45 € (338,85 KN).

Viza:

• Hrvatski državljani za ulazak u Egipat trebaju vizu. Putovnica mora važiti najmanje 6 mjeseci i imati 2 prazne stranice. Viza se dobiva na aerodromu, po dolasku u Aleksandriju.

• Molimo vas da nam sljedeće podatke dostavite najkasnije 30 dana prije polaska:

• - ime i prezime (onako kako je navedeno u putovnici), datum rođenja, broj putovnice te datum do kada vrijedi.

Točnost podataka obveza je putnika i agencija ne odgovara u slučaju bilo kakvih poteškoća uzrokovanih netočnim podacima niti snosi financijsku odgovornost.

Covid-19 uvjeti:

• Nema nikakvih ograničenja za ulazak u Egipat. Trenutačno nije potrebno ništa osim putovnice i vize.

Podaci o letu:

• Prijevoznik: Turkish Airlines

• Dozvoljena težina prtljage: 30 kg + 1 komad ručne prtljage do 8 kg.

• U programu su navedena lokalna vremena dolazaka / odlazaka.

• Zrakoplovna kompanija zadržava pravo promjene vremena letova.

Napomene:

• Kategorizacija hotela odgovara službenoj kategorizaciji Egipta te može biti različita u odnosu na europsku kategorizaciju.

• Neispravni putni dokumenti koji za posljedicu imaju odustajanje od putovanja, ni u kojem slučaju ne obvezuju organizatora putovanja te se primjenjuju uvjeti Otkaza putovanja organizatora.

• Organizator putovanja ima pravo na izmjenu programa putovanja kao i vremena polazaka zrakoplova (kad to zahtijeva situacija tijekom putovanja), ali garantira da će se program izvesti u cijelosti.

• Pristojbe zračnih luka su podložne promjenama, konačan iznos se određuje na dan izdavanja zrakoplovne karte cca 14-7 dana prije putovanja, a prema uvjetima zrakoplovne kompanije koji vrijede za grupe izdaju se za sve putnike u jednom danu.

- U slučaju promjene tečaja ili cijena kalkulativnih elemenata u iznosu većem od 1,5% organizator putovanja ima pravo na promjenu cijene aranžmana.

Za navedeni aranžman vrijede Opći uvjeti putovanja. Prilikom prijave potpisujete Ugovor o putovanju čiji su sastavni dio Opći uvjeti i uputstva za turističke aranžmane. Vašim potpisom iskazujete suglasnost s Općim uvjetima.

Molimo vas da se o sigurnosti putovanja u pojedine zemlje informirate u Ministarstvu vanjskih i europskih poslova ili na njihovoj web stranici: www.mvep.hr

Preporučujemo putno osiguranje jedne od osiguravajućih kuća. Agencija ima zaključenu Policu osiguranja od odgovornosti organizatora kod Adriatic osiguranja, broj police OV0682935672 i jamčevno osiguranje kod Adriatic osiguranja, broj police OV0682935673. Organizator zadržava pravo promjene rasporeda sadržaja programa u slučaju više sile. Ostali uvjeti prema OPĆIM UVJETIMA INTEGRALA ZAGREB d.o.o. Zagreb, 13.06.2023.

Egipat :

- Službeno ime: Arapska Republika Egipat
- Broj stanovnika:102 milijuna
- Glavni grad: Kairo
- Jezik: arapski
- Religija: velika većina muslimani
- Vremenska razlika: +1
- Novčana jedinica: egipatska funta (EGP)
- Napon struje: 220V
- Cijepljenje: nije potrebno
- Mobilne mreže: Orange, Vodafone, Telecom Egypt
- Pozivni broj zemlje: +20
- Kupovina: na tržnicama i u trgovinama nude se tradicionalni suveniri, predmeti od zlata drveta ili kože, tepisi, papirus i slično. Cjenkanje je dio egipatske kulture i potreban je oprez.

- Odjeća i obuća: zbog velikih razlika u temperaturi između dana i noći predlažemo odijevanje u slojevima te topliju odjeću za večeri i udobnu obuću.

- Hrana i piće: preporučujemo konzumaciju pića pakiranih u bocama, nekorištenje leda, a alkoholna pića mogu se konzumirati u hotelskim restoranima i barovima. Ne preporučujemo jesti uličnu hranu.

- Klima: suptropska pustinjska klima, na sjeveru zemlje mediteranska. Kiše su vrlo rijetke, uglavnom u obliku kratkotrajnih pljuskova. Od ožujka do lipnja mogu puhati vrući vjetrovi.

7.4. Appendix D

Velike priče

Operiram pacijente s teškim dijagnozama koje su drugi odbili liječiti. Najteže je kad im morate reći kolike su šanse da će živjeti

Docent Petrović za Telegram govori o školovanju, karijeri i otkriva koje su najvažnije odlike odličnog kirurga

Na temelju vlastitog iskustva docent Petrović zaključuje kako je najgore zbližavanje s bolesnicima. "Takav bliski kontakt i mogući naknadni loš ishod, iscrpljuje liječnika kao čovjeka." Nakon što vidi nalaz docent Petrović prenosi informacije bolesniku, a uz njegovu suglasnost i članovima obitelji. " A sve to je često vrlo neugodno i nezahvalno."

Šira javnost prvi puta je čula za docenta dr. Igora Petrovića, iz Zavoda za hepatobilijarnu kirurgiju i transplantaciju abdominalnih organa KBC-a Zagreb, nakon što su nedavno jednom pacijentu presađeni srca i jetra. Docent Petrović bio je voditelj kirurškog tima koji je bio zadužen za transplantaciju jetre. Takva operacija, koja nosi sa sobom popriličan rizik, prvi put je izvedena u Hrvatskoj, a rijetko se radi i u svijetu. Pacijent je imao metaboličku bolest, amiloidozu, patološko nakupljanje bjelančevina u srcu, bubrezima, jetri, koji su zbog toga bili ozbiljno oštećeni.

Posljedica je bila teška kardiomiopatija, odnosno bolest srčanog mišića, što je posljedično dovelo do bolesti jetre. Sve je to pak izazvalo acites, nakupljanje slobodne tekućine u trbušnoj šupljini. S obzirom na teško zdravstveno stanje pacijenta odlučeno je da se napravi kombinirana operacija te da se prvo presadi srce, a odmah potom i jetra. Prije pola godine, priča docent Petrović, pacijentu kojem je prije nekoliko godina transplantirano srce, također je presađena jetra.

“To je za pacijenta lošija varijanta: presađeno srce, naime, i dalje je trpjelo jer je jetra neprestano proizvodila patološke amiolide, bjelančevine kojih inače nema u tijelu.” Unatoč tomu jetra su bila funkcionalno zdrava, pa se takva ponekad koristi za presađivanje kod, primjerice, starijih pacijenata s karcinomom jetrenih stanica.

Zabrinjavajuća informacija stigla je prije operacije

Kod 45-godišnjeg pacijenta jetra je izgubila funkciju, što se još nije očitovalo u laboratorijskim nalazima, ali je došlo do takozvane kardijalne ciroze jetre kao posljedica dugotrajne dekompenzacije srca. Srce i jetra stigli su u Zagreb s dva zasebna leta. Troškovi prijevoza podmiruju se iz posebnog fonda pri Ministarstvu zdravstva za transplantaciju jetre, a takvi prijevozi obično se obavljaju vladinim zrakoplovom.

Prije operacije stigla je zabrinjavajuća informacija koja se nije mogla provjeriti, da jetra neće stići na vrijeme, odnosno unutar 12 sati od kako se izvadi iz organizma donora. "Ipak odlučili smo presaditi jetru i ako zakasni jer drugog rješenje nije bilo", napominje docent Petrović te dodaje kako je na sreću u Njemačkoj krvotok zaustavljen 2 sata kasnije od najavljivanog termina pa se zahvat mogao obaviti unutar predviđenog vremena za hladnu ishemiju. Jetra se inače mora presaditi unutar 12 sati, a srce u roku od 4 do 6 sati od kako je uzeto od donora. "Ugradili smo jetru i osigurali protok krvi unutar deset sati od kako su jetri u Njemačkoj stavili 'kleme' i obustavili krvotok."

Najveći izazov bio je za anesteziologe

Presađivanje srca počelo je oko 6 sati ujutro i trajalo je do 11 sati kad se završilo sa stabilizacijom pacijenta. Tada je došao na red tim docenta Petrovića. "U tehničkom smislu to nije bio preveliki izazov, takve su operacije na Rebru postale rutina. Najveći je izazov bio za anesteziologe koji su trebali neutralizirati nestabilnosti tlaka i time osigurati odgovarajuću funkciju presađenog srca za transplantacije jetre."

Kompletna operacija završila je oko 17 sati. U transplantaciji jetre docentu Petroviću pomogli su doktori Ante Gojević i Jurica Žedelj, od instrumentarki, medicinske sestre Dijana Stiperski i Slavica Berić, a anesteziologinje su bile doktorice Tina Tomić, Martina Čalušić i Karolina Režek te anesteziološka tehničarka Nataša Gojak.

Duge i temeljite pripreme za zahvat

Pripreme za takav zahvat bile su duge i temeljite. Tek nakon konzultacija kardiologa, kardiokirurga, abdominalnih kirurga, gastroenterologa i anesteziologa, odlučilo se krenuti u sinkroniziranu transplantaciju koju je pacijent, pokazalo se na kraju, jako dobro prebrodio.

Za uspješno presađivanje jetre potreban je i eksplantacijski tim koji uzima organ od donora. Kad se u nekoj jedinici intenzivnog liječenja nađe pacijent kojem je dokazana moždana smrt, to se odmah javlja bolničkim koordinatorima za transplantacije. Ako se dobije suglasnost obitelji podaci o donoru prijavljuju se nacionalnom koordinatoru u Ministarstvu zdravstva, a

on ih šalje Eurotransplantu. Ako u inozemstvu nema posebno hitnog slučaja, tada se jetra šalju na KB Merkur ili na Rebro.

Tri posebno zahtjevne transplantacije odrađene u sedam dana

Tijekom 2022. godine na Rebru je obavljeno 106 presađivanja, a od sredine prosinca čak 18 transplantacija i sve su one uspješno izvedene. U samo sedam dana napravljene su tri posebno zahtjevne transplantacije: transplantacija jetre sa živog donora, kombinirano presađivanje srca i jetre 45-godišnjem pacijentu te transplantacija pluća djetetu od 11 godina. Takve operacije velika su rijetkost i u svijetu.

Kardiokirurg profesor Hrvoje Gašparović kazao je tim povodom kako oko 70 posto bolesnika nakon transplantacije srca ima odličnu kvalitetu života, a oko 90 posto vrlo dobru. Na Rebru je do sada također obavljeno 2.500 transplantacija bubrega, a prošle godine bubrege je dobilo troje djece. Jedino se na Rebru, kaže docent Petrović, presađuju bubrezi kod djece, a poseban je raritet što su srca presađena i dvojici brata blizanaca.

Došlo je do ozbiljne krize donora organa

Istodobno s tim sjajnim rezultatima došlo je, posve neočekivano, do ozbiljne krize donora organa. Hrvatska je, prema broju transplantacija jetre na milijun stanovnika, bila do korone među najboljima na svijetu, a 2010. čak prva u svijetu. Sad se broj donora smanjio za više od 50 posto, a sličan je trend zabilježen i u svijetu. “Prvi puta se događa,” otkriva docent Petrović, “da ljudi umiru na listi čekanja jer nema dovoljno donora. Samo u Merkuru na listi čekanja za transplantaciju jetre nalazi se više od 200 bolesnika”.

No, na Rebru raste broj transplantacija jetre, posebice nakon što je iz KB Merkur, 2021. došla gastroenterolog profesorica Anna Mrzljak, koja je znatno povećala mobilizaciju primatelja na listu za presađivanja jetre. Jednako važnu ulogu u spomenutoj renesansi transplantacije jetre imao je voditelj tima za transplantaciju jetre, profesor Davor Mijatović te pročelnik Zavoda za hepatobilijarnu kirurgiju docent Hrvoje Silovski. U taj program odmah su se, kao predstavnici srednje generacije liječnika, uključili docent Petrović i doktor Tomislav Baotić, te liječnici Ognjan Deban, Goran Pavlek, Jurica Žedelj, Ivan Šeparović, Ivan Romić i Iva Martina Strajher koji najčešće rade eksplantacije jetre.

Teže je presaditi jetru nego srca

Osim što se presađivanja srca i jetre razlikuju po dužini hladne ishemije, čuvanje organa u ohlađenoj prezervacijskoj otopini, ona se razlikuju i po težini samog zahvata. Za laike je pomalo nevjerojatno da je tehnički i vremenski transplantacija jetre zahtjevnija od presađivanja srca.

“Zapravo je presađivanje jetre najteže u transplantacijskoj medicini, ako se, dakako, izuzmu kompleksne multiorganske transplantacije. Problem predstavlja ponekad vrlo zahtjevna hepatektomija, odstranjenje bolesne jetre uz potencijalna značajna krvarenja, naročito kod re-transplantacija. Također je izazov arterijska anastomoza koja može trombozirati te u konačnici opasnost od odbacivanja organa,” objašnjava docent Petrović. I na kraju, dodatni je problem što ne postoji mehanička zamjena za funkcionirajuću jetru.

Ljudi već nakon sedam dana znaju biti pušteni kući

Iznimno je važna pažljiva hemostaza kako bi se izgubilo što manje krvi. “Bolesnici koji manje krvare imaju u pravilu puno bolji postoperacijski tijek, bolja im je funkcija bubrega i jetrenog presatka”, napominje docent Petrović te objašnjava da je postoperacijski oporavak bolesnika koji su opterećeni s imunosupresijom, iznimno osjetljiv u kontekstu infekcija. Najčešće se pri presađivanju jetre primjenjuje takozvana piggy-back tehnika koja sačuva kontinuitet dijela donje šuplje vene koji se nalazi iza jetre.

“Alkoholizam koji izaziva cirozu te virusne infekcije jetre hepatitisom B i C najčešće su patologije koje dovode do transplantacije jetre. Bolesnici se, međutim, lako odlučuju na presađivanje jetre jer im je kvaliteta života jako loša, a nakon operacije se brzo oporavljaju. Već nakon petog dana budu funkcionalni, a nakon sedmog dana znaju biti pušteni na kućnu njegu”, ističe docent Petrović.

Zabilježeno samo jedno akutno odbacivanje

U 34 operacije presađivanja jetre na KBC Rebro od sredine prosinca 2021. godine, dogodilo se samo jedno akutno odbacivanje, a i ono je vrlo uspješno medikamentozno sanirano i bolesnik je sada dobro. Ima pacijenata na kojim se izvrše dvije ili tri transplantacije jetre tijekom života. Do toga dolazi zbog povrata osnovne bolesti, kojekakvih komplikacija ili tromboze jetrene arterije. Docent Petrović napominje kako je u postoperativnom oporavku imunosupresivna terapija iznimno važna.

“Postoje vrlo potentni lijekovi koji suprimiraju imunološki sustav i sprečavaju moguće odbacivanje transplantiranog organa, odnosno omogućavaju preživljenje organa donora u organizmu primatelja.”

Dodatnu edukaciju dobio je na KB Merkur

Nakon završenog Medicinskog fakulteta u Zagrebu docent Petrović pet godina je specijalizirao opću kirurgiju na Rebru, a potom su slijedile dvije godine subspecijalizacije abdominalne kirurgije. Nakon toga je 2010. godine postao subspecijalist abdominalne kirurgije, a uže mu je područje interesa hepatobilijarna kirurgija, dakle, kirurgija jetre, žučnih vodova i gušterače. Uz to gradio je i akademsku karijeru, završio je magisterij i doktorat te je sada docent na Medicinskom fakultetu u Zagrebu.

Dodatnu edukaciju prošao je u KB Merkur gdje je nekoliko godina pratio tridesetak transplantacija te brojne onkološke zahvate koje su izveli primarijus Branislav Kocman i docent Stipislav Jadrijević te drugi tamošnji kirurzi. "Zahvaljujem im na svemu što sam naučio i što smo mogli kopirati njihovu tehniku i postupak transplantacije jetre. Zbog toga što se na Merkuru obavljaju transplantacije na najvišoj razini, nije imalo potrebe odlaziti u inozemstvo", ističe docent Petrović.

Prva znanja o transplantaciji jetre stekao je na Rebru, gdje se još od 1990. godine, s prekidima i različitom učestalošću, provodi transplantacija jetre u odraslih, a potom i dječja transplantacija jetre. "S dužnim poštovanjem spomenuo bih imena rebarske transplantacije jetre poput profesora Vuka Borčića, Mate Škegre, Stipe Batinice te doktora Ante Gojevića, Boška Romića i Zlatka Fiolića, naših prethodnika i učitelja", naglašava docent Petrović.

Ovisnost o adrenalinu ga ispunjava

Priznaje da ga najviše ispunjava ovisnost o adrenalinu, rad u operacijskoj sali te izazovne operacije. Najgore je pak, priča, kad se napravi operacija, na način kao u prethodnih stotinjak zahvata, a poslije toga stvari ipak krenu po zlu.

"To se najviše pamti, više od uspješnih zahvata. Iscrpljujuće je kad nakon operacije pacijenti dugo borave u intenzivnoj njezi, kad dođe do komplikacija ili u slučaju lošeg ishoda," priča docent Petrović te objašnjava kako postoperativni tijek u najvećoj mjeri ovisi o općem stanju pacijenta. "Ako je ono slabo ili je pacijent na imunosupresivnoj terapiji, tada se znaju dogoditi ozbiljne komplikacije."

Prije svake operacije ponavlja teoretski dio

Prije svake operacije, kaže docent Petrović, uvijek ponavlja teoretski dio. “Osim toga danas se na internetu te na specijaliziranim kirurškim kanalima mogu vidjeti zahvati koji prikazuju nove tehnike, primjerice, na gušterači. Može se također upoznati i s postoperativnim komplikacijama koje bitno pridonose mortalitetima.”

No transplantacije jetre nisu “core business” docenta Petrovića. Njegov glavni posao je onkološka i hepatobilijarna kirurgija, najteže područje u abdominalnoj kirurgiji jer ti tumori imaju najlošiju prognozu.

Bez radikalne kirurgije nema prave koristi za onkološke bolesnike

Onkološka radikalna kirurgija s limfadenektomijom, poseban je izazov za docenta Petrovića. “Bez radikalne kirurgije nema prave koristi od kirurgije u onkoloških bolesnika. Onkološka operacija gušterače, ekstenzivne resekcije jetre i žučnih vodova tehnički su puno zahtjevnije od jednostavne transplantacije”, priča docent Petrović te dodaje da “transplantacija jetre, kad imamo primarnu transplantaciju ili kad je to prvo presađivanje, nije posebno zahtjevna. Kad se savlada tehnika i rutina, tada je ona lakša od složenih onkoloških operacija.”

Osim toga onkološke operacije su vremenski puno duže od transplantacija, često zahtijevaju resekciju krvnih žila i susjednih organa i zbog toga fizički i psihički opterećuju kirurga. Operacije gušterače ili resekcija jetre traju najmanje 4 sata, a nekada i dvostruko duže.

Raste broj onkoloških bolesnika

No, najveći je problem, tvrdi docent Petrović, što su prognoze kod onkološke patologije vrlo nezahvalne. “Stoga je pacijenta, nakon što ga se obavijesti o dijagnozi, najvažnije upoznati sa statistikom preživljavanja i kvalitetom života nakon kirurškog zahvata. I to je, moram priznati, često najteži dio našeg posla.”

Na temelju vlastitog iskustva docent Petrović zaključuje kako je najgore zbližavanje s bolesnicima. “Takav bliski kontakt i mogući naknadni loš ishod, iscrpljuje liječnika kao čovjeka.” Nakon što vidi nalaz docent Petrović prenosi informacije bolesniku, a uz njegovu suglasnost i ostalim članovima obitelji. ” A sve to je često vrlo neugodno i nezahvalno.”

Statistički raste broj onkoloških bolesnika i što je još gore pacijenti često dolaze u sve kasnijoj fazi bolesti kad je teško nešto postići. Stoga ne čudi što u velikom broju slučajeva bolesnici kojima je dijagnosticiran tumor to često doživljavaju kao izricanje smrtne presude.

Jedan od najtežih tumora je onaj na gušterači

Jedan od najtežih oblika tumora je onaj na gušterači. “Problem je što kod velikog postotka primarnog tumora gušterače, koji je lokalno operabilan, već u fazi operacije postoje mikrometastaze koje nekoliko mjeseci nakon operacije postaju evidentne,” opisuje docent Petrović.

Najpodmukliji su pak tumori trupa i repa gušterače koji se kasno otkriju. U vrijeme postavljanja dijagnoze karcinom gušterače, priča docent Petrović, u 85 posto slučajeva već se proširio u lokalne strukture ili je metastazirao u jetru i pluća. “Kod tih tumora najčešće nema simptoma ili se vrlo kasno razvijaju, kad su se metastaze već proširile. Statistika je kod radikalne kirurgije tumora glave gušterače neumoljiva: čak do 40 posto slučajeva dogode se postoperativne komplikacije.”

Posebno je ponosan na radikalne zahvate kod tumora gušterače

Docent Petrović ne krije kako je posebno ponosan na radikalne kirurške zahvate kod tumora gušterače na bolesnicima koji su odbijeni u drugim ustanovama gdje su proglašeni neoperabilnim. Nedavno su jednoj pacijentici odstranili cijelu gušteraču, izvedena je takozvana totalna pankreatektomija zbog karcinoma.

“Portalnu venu smo izrezali zajedno s tumorom i taj smo defekt primarno zašili, a arterije smo oslobodili od tumorske infiltracije. To je bio, ako ništa drugo, dobar palijativni zahvat jer je bolesnica trpjela bolove prije operacije. Ti tumori se, naime, infiltriraju u retroperitonealne živce i izazivaju nesnosne bolove. Mi smo pacijenticu lišili bolova, a vrijeme će pokazati koliko smo joj pomogli dugoročno, u smislu dužine preživljenja”, priča docent Petrović.

Kod granično operabilnih tumora gušterače, radikalna kirurgija poboljšava kvalitetu života pacijenta, a je li pomogla u preživljavanju ovisi o biologiji tumora. “Na to se, nažalost, ne može utjecati, niti se može predvidjeti hoće li netko ubrzo dobiti metastaze. Problem je što se sadašnjom dijagnostikom ne mogu vidjeti mikrometastaze.”

Puno se očekuje od genetskog profiliranja tumora

Puno se očekuje, priča, od genetskog profiliranja tumora hepatobilijarnog trakta. “Metodama molekularne biologije moglo bi se definirati kakav je biološki podtip duktalnog adenokarcinoma gušterače, pa bi se prema tome mogla odrediti ciljana onkološka i odgovarajuća kirurška terapija. Tada bi se moglo pokazati i da kirurško liječenje uopće nije opcija, iako u startu se doima kao optimalni način liječenja.”

U liječenju tumora puno pomažu pametni lijekovi, a jedna od mogućnosti je i radiokirurgija. “To je ciljana radioterapija tumora, ali po mom sudu ona bi se trebala ograničiti samo na one tumore koji nisu kirurški radikalno operabilni. U praksi se potvrđuje da radikalno kirurško odstranjenje tumora, ako je moguće, donosi najviše benefita za pacijente.”

Naglasak pri liječenju, tvrdi docent Petrović, valja staviti i na multidisciplinarnost. “Uzdamo se također u sofisticiranu onkološku terapiju, prije i poslije operacije, te dijagnostiku koja bi mogla napraviti razliku između onih koji će imati koristi od operacije, od onih koji je neće imati.”

Raste i broj tumora debelog crijeva

U porastu je također broj tumora debelog crijeva što možemo, smatra docent Petrović, dobrim dijelom zahvaliti načinu života i prehrane. “Kad se otkrije u ranoj fazi, prognoza je zadovoljavajuća i dobra, no loše je kad je tumor proširen u limfne čvorove ili udaljene metastaze.” Sretna je okolnost, kaže, da se rak probavnog trakta može rano otkrivati kolonoskopijom i gastroskopijom ili kad se u ranoj fazi pojavi anemija ili krvarenja. “Pri tomu je endoskopija probavnog trakta najvažnija.”

Za razliku od tumora debelog crijeva, kod karcinoma gušterače, duktalnog adenokarcinoma, prognoze su bitno lošije. Najčešće se pojavljuje u glavi gušterače, nešto je češći u muškaraca nego kod žena. Uz radikalan kirurški zahvat kad je situacija idealna i kad se metastaze nisu proširile na limfne čvorove, može se osigurati srednje preživljavanje od 24 do 36 mjeseci.

O liječenju svakog pacijenta odlučuje onkološki multidisciplinarni tim

Onkološki multidisciplinarni tim odlučuje o načinu liječenja svakog bolesnika. U timu se nalaze specijalisti raznih profila, kirurzi, gastroenterolozi, radiolozi i onkolozi. Oni odlučuju treba li bolesnik primarno ići na onkološko liječenje, pa onda na operaciju ili valja odmah izvesti kirurški zahvat. Ponekad kirurškom zahvatu prethodi kemoterapija ili radioterapija koja poboljšava preživljavanje nakon kirurškog liječenja.

U nas ekonomika nekog zahvata ili surova statistika, priča docent Petrović, nisu toliko bitni kao, primjerice, u SAD-u. “Ako mislimo da možemo pomoći pacijentu, tada poduzimamo sve što je u našoj moći, bez obzira na troškove liječenja. Pacijentu predočimo sve rizike, ali i mogućnosti dobrog ishoda. Koliko god je neki zahvat rizičan, ako postoji šansa za poboljšavanje kvalitete života ili produljenje života, uvijek ćemo pokušati pomoći.”

Zanimanje studenata za kirurgiju je u padu

Za kirurga je, priča, iznimno važna manualna spretnost, iskustvo i broj operacija, dobra edukacija te hladnokrvnost i teoretsko znanje. “Valja također biti spreman preuzeti rizik jer bez toga nema uspješnog kirurga. Posebno je važno da kirurg u stresnim situacijama ne podlegne panici jer se tada nervoza prenosi na druge. Sve ovisi o kirurgu, što je veće iskustvo manja je nervoza”, napominje docent Petrović

Otkrio nam je i jednu zanimljivost: zanimanje studenata medicine za kirurgiju, a pogotovo abdominalnu, u drastičnom je padu. “Kad sam se 2001. javio na natječaj za specijalizaciju prijavilo se oko 30 kandidata, danas ih nema više od desetak. Vjerujem da je razlog tomu što se kvaliteta života može postići na lakši način, na drugim poslovima. Kirurgija je zahtjevna psihički i fizički, čovjek se uzrujava, noćima na spava kad se dogode komplikacije, pa ju mnogi studenti medicine izbjegavaju.”

Kao docent na Medicinskom fakultetu uočio je veliku razliku između generacija kad je on studirao medicinu i sadašnjih studenata.” Oni su puno slobodniji, otvoreniji, ne samo studenti nego i specijalizanti. Znaju sve o svojim pravima i osviješteni su, trend liberalizacije je itekako prisutan. Pa, među ostalim, ne poštuju toliko autoritete kao što smo to mi radili. A hijerarhija je u medicini presudna, bez nje nema ni ozbiljne kirurgije, mora se znati tko je glavni.”

U abdominalnoj kirurgiji je sve više žena

Kao i u drugim dijelovima medicine tako je i u abdominalnoj kirurgiji sve više žena, a odlasci kirurga u inozemstvo, priča docent Petrović, na KBC Rebro nisu toliko veliki kao u nekim drugim bolnicama.

“Medicinske sestre češće odlaze i dolaze, no sreća je da imamo sestre veteranke koje su godinama s nama.” Što se tiče opreme, docent Petrović kaže kako su u sadašnjoj ekonomskoj situaciji u zemlji, vrlo dobro opremljeni te da nema problema ni s materijalima i lijekovima. “Kirurgija je najmanji potrošač na Rebru, pogotovo kad se uspoređuje s, primjerice, hematološkom ili onkološkom terapijom koje su enormno skupe.”

Na kraju razgovora saznali smo još jednu zanimljivost koja najbolje ilustrira snagu volje i upornost docenta Petrovića. “Svaki radni dan ustajem u 5 sati ujutro i redovito odlazim u teretanu, a uživam i u vožnji biciklom po brdima te u skijanju.”

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