THE PLASTIC ON YOUR PLATE

WHEN AND HOW WE BECAME CONSUMERS OF PLASTIC

by Silvio Greco

NOT ONLY DO WE TRANSFER IT TO THE ENVIRONMENT, WE EAT IT, WE DRINK IT, WE BREATHE IT. PLASTIC FINDS ITS WAY INTO HUMAN TISSUE AND INTO BLOOD. THE PROBLEM IS TOO CLOSE FOR US TO IGNORE IT ANY LONGER.

TABLE OF CONTENTS

• **PREFACE**

• BY ROBERT DANOVARO

At the 2017 G7 Technology and Science Meeting in Tsukuba, the international community identified three priorities for global research in the following decade: the health of the oceans, the spread of diseases, and big data. In order to confront the problem of ocean health, the G7's Council of Research Ministers indicated waste in the sea as a priority issue, partly due to its greater visibility. Given that plastic accounts for 80% of this waste, it isn't challenging to identify the principal foe in this struggle. We can thus say with good reason that the global fight against plastic will be crucial in our defense of natural ecosystems in the next decade. But battles cannot be won without a thorough knowledge of one's enemy, nor correct solutions found without solid scientific foundations.

This book provides an essential and original contribution in this direction. It explains the history of plastic, its composition, and then takes on the problems linked to its disposal. Plastic's impact is even more relevant in marine environments where it constitutes the preeminent form of waste - from the poles to the tropics, the ocean surface to the deepest abysses. This book shows, with clarity and the support of ample data and numerous examples, how plastics quickly become a cocktail of contaminants that make their way into marine organisms and eventually end up on our tables in food and, unfortunately, even in tap water.

The author's experience and his profound knowledge of marine life and its resources, fishing, and cooking, allows him to present a unique focus in the panorama of popular scientific literature, and to formulate concrete and convincing proposals.

•••

Roberto Danovaro, President of the Anton Dohrn Zoological Station National Institute of Biology, Ecology and Marine Biotechnology

CHAPTER ONE

WHAT WE TALK ABOUT WHEN WE TALK ABOUT PLASTIC

- A SHORT HISTORY OF A REVOLUTIONARY MATERIAL
- PROPERTIES OF PLASTIC AND ITS DISPOSAL
- BIBLIOGRAPHY

CHAPTER TWO

PLASTIC AND THE MARINE ENVIRONMENT

- MORE PLASTIC THAN FISH
- THERE IS TRASH AND TRASH
- ISLANDS OF PLASTIC
- FROM THE MEDITERRANEAN TO THE ANTARCTIC
- THE PLASTIFICATION OF THE SEA FLOOR
- INDIGESTION OF PLASTIC
- NETS, BAGS, AND MORTAL TIES
- PLASTIC RELICS AND HITCHHIKING SPECIES
- FROM MACROPLASTICS TO NANOPLASTICS
- THIS WAY AND THAT ON A STREAM OF WATER
- PLASTIC AND CHEMICAL CONTAMINANTS
- A NICE MIXTURE OF CONTAMINANTS
- HOW PLASTIC ENTERS ORGANISMS
- BIBLIOGRAPHY

CHAPTER THREE

THE WAYS OF PLASTIC IN NUTRITION

- GENERAL ASPECTS
- PLASTIC AND FISH
- PLASTIC AND SALT
- PLASTIC AND TAP WATER
- THE RISKS OF BOTTLED WATER AND OF DRINKS
- HONEY AND BEER: SWEETNESS AND POLYMERS

G GIUNTI EDITORE

- ECOSYSTEMS ON LAND, AGRICULTURE AND ANIMAL HUSBANDRY
- THE HIDDEN DANGERS OF PACKAGING
- PLASTICS AND HUMAN HEALTH
- BIBLIOGRAPHY

CHAPTER FOUR

PLASTIC: FROM SOLUTIONS TO REFLECTIONS

- EFFECTS ON CLIMATE CHANGE
- FROM MARINE WASTE TO THE EXTENDED RESPONSABILITY OF THE PRODUCER
- A NEW LOGIC REGARDING WASTE
- SOME POSITIVE EXPERIENCES
- TRAVELS COVERED IN PLASTIC
- LIFE AND THE PLASTIC COATED MIND
- BIBLIOGRAPHY

APPENDIX

THE EXTENDED FAMILY OF PLASTIC

Polyacetals (POM) 157

Cellulosic polymers 157

Fluoropolymers 158

Polyamides (PA) and Aromatic polyamides 159

Polyacrylonitrile (PAN) 160

Polyamide-imide (PAI) 161

Polyarylsates 161

Polybenzimidazoles (PBI) 162

Polybutylene (PB) 162

Polycarbonates (PC) 162

Thermoplastic polyesters 162

Polyetherimides (PEI) 164

G GIUNTI EDITORE

Polyethylene (PE) 164 Polyethylene copolymers 165 Polyimide (PI) 166 Polyketones (PEK - PEEK - PEEKK) 166 Polymethylmethacrylate (PMMA) 166 Polymethylpentene (PMP) 167 Polyphenylene oxide (PPO) 167 Polyphenylene sulphide (PPS) 168 Polyphenyl PPA) 168 Polypropylene (PP) 168 Polyurethane (PU) 169 Styrenic resins 169 Polysulfones (PSU) 171 Vinyl-based resin 171 Polyisobutylene (PIB) 172 Polyvinyl acetate (PVA) 173 Unsaturated polyesters (UP) 173 Alkyd resins 173 Allylic resins (DAP) 174 Epoxy resins (EP) 174 Phenolic resins - Phenoplasts (PF) 174 Furanic resins 174 Melamine resins (MF) 175 Urea resins (UR) 175