
OOZE
AN OCEANOGRAPHY ZINE
PIPER MOHRING

HUNDREDS OF FEET DOWN IN THE DEEP OCEAN...

SHELLS, SKELETONS, PERISHED PLANKTON...

ALL LIE TO REST IN A GOOPY GRAVEYARD.

THIS DECEASED DEBRIS DRIFTS SLOWLY DOWN THE WATER COLUMN TO COAT THE BOTTOM OF THE OCEAN, FORMING A SLIMY SEDIMENT CALLED **OOZE.**

IT'S MADE UP OF AT LEAST 30% **BIOGENOUS MATERIAL**— PRODUCED BY LIVING THINGS— AND PILES UP SLOWLY, ONLY A FEW CM PER MILLENNIUM.

THE PARTICLES OF SEDIMENT ARE MUD-SIZED (< 63 μm), ABOUT 2/3 THE WIDTH OF A STRAND OF HAIR.

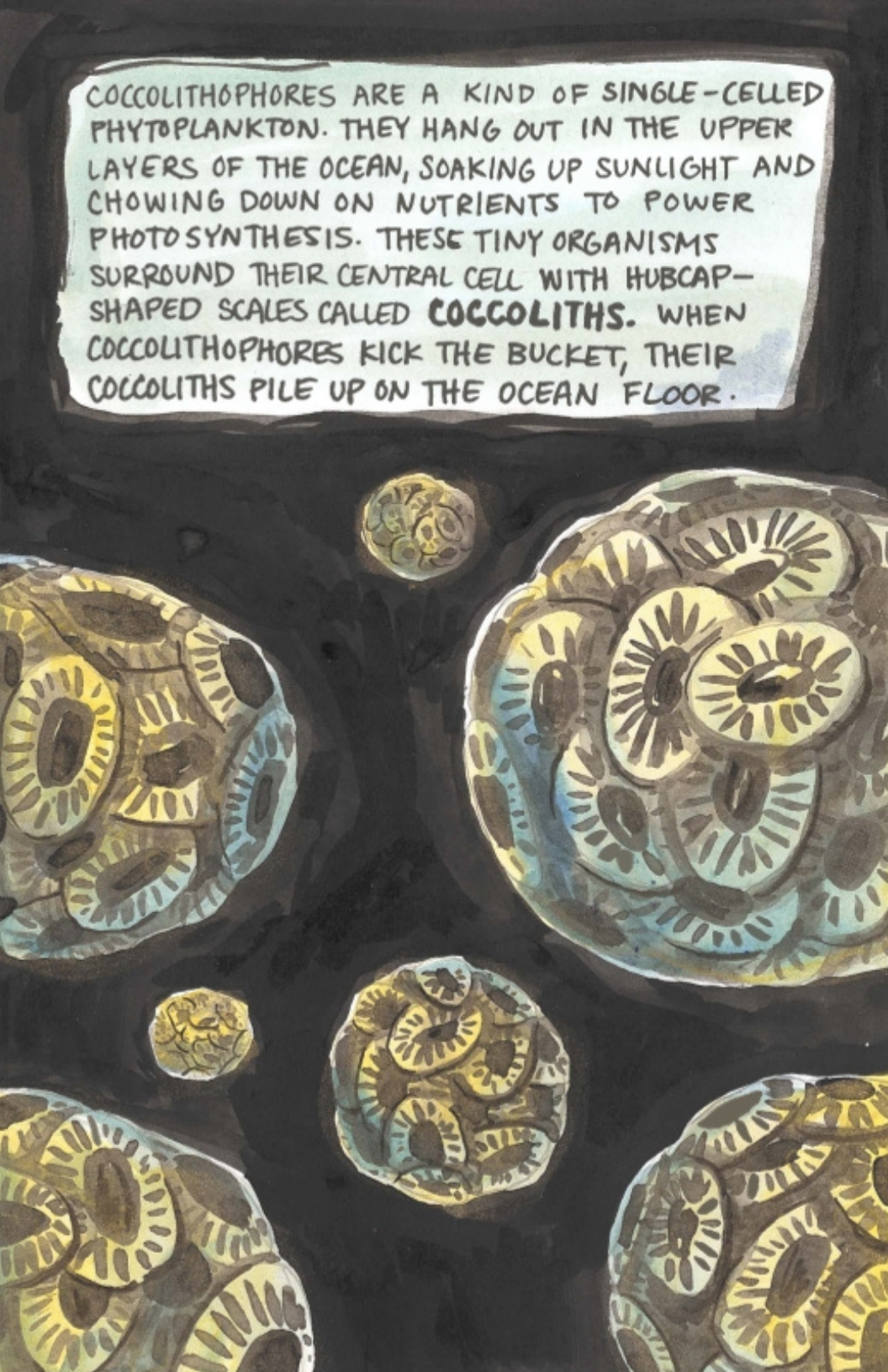
THERE ARE TWO MAIN TYPES OF OOZE: **CALCAREOUS** AND **SILICEOUS.**


CALCAREOUS OOZE IS THE MORE COMMON TYPE, COVERING NEARLY HALF OF THE OCEAN FLOOR. THAT'S ABOUT THE AREA OF THE ENTIRE LANDMASS OF EARTH!
IT'S MADE UP OF CALCIUM CARBONATE FROM THE SHELLS AND SKELETONS OF MARINE CREATURES.
CALCAREOUS OOZE COLLECTS IN THE SHALLOWER WATERS – ONCE IT PLUNGES BELOW THE CARBONATE COMPENSATION DEPTH (CCD), IT DISSOLVES BEFORE IT CAN HIT THE SEAFLOOR.

SEE THAT?

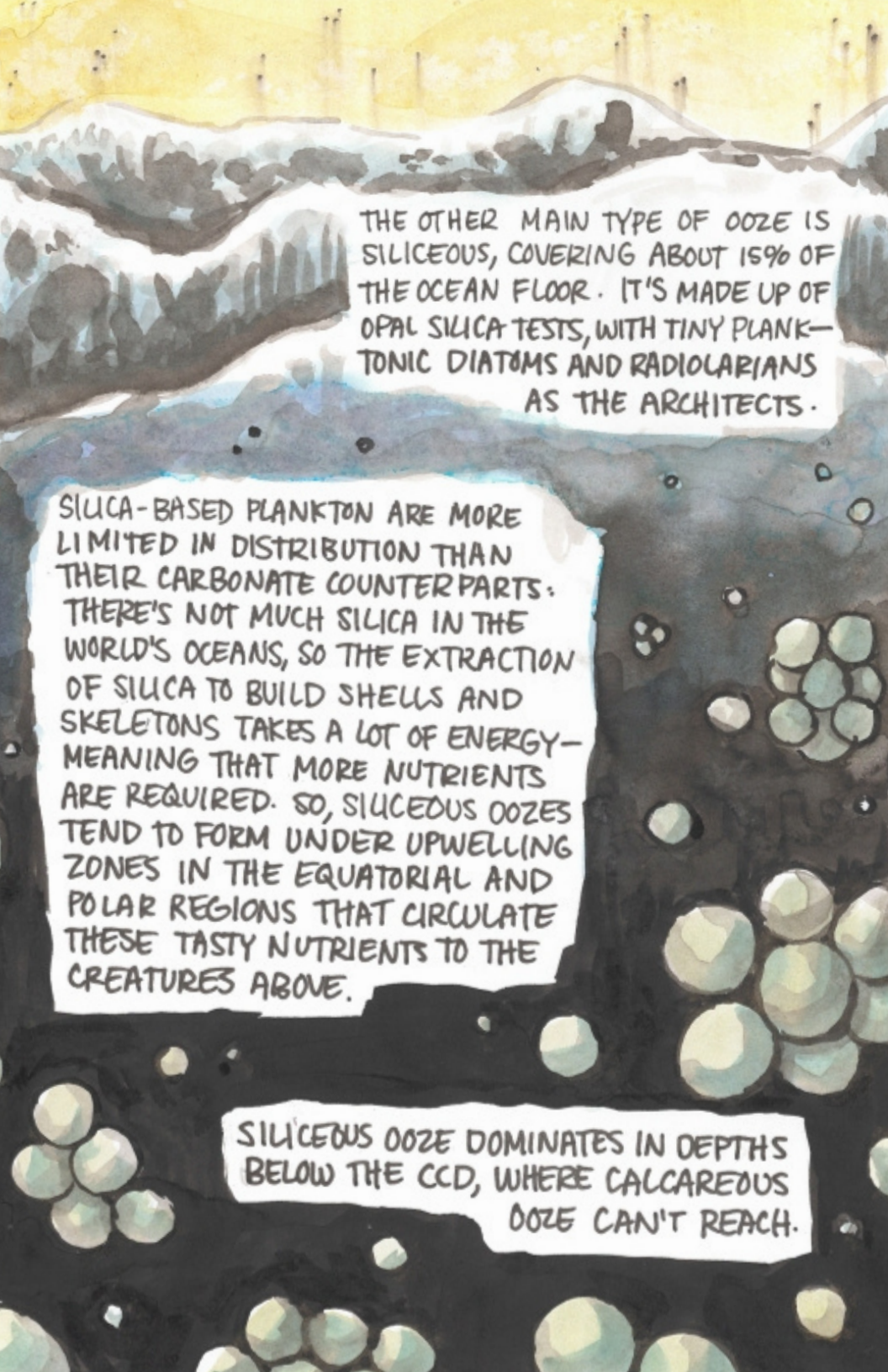
LET'S ZOOM IN.

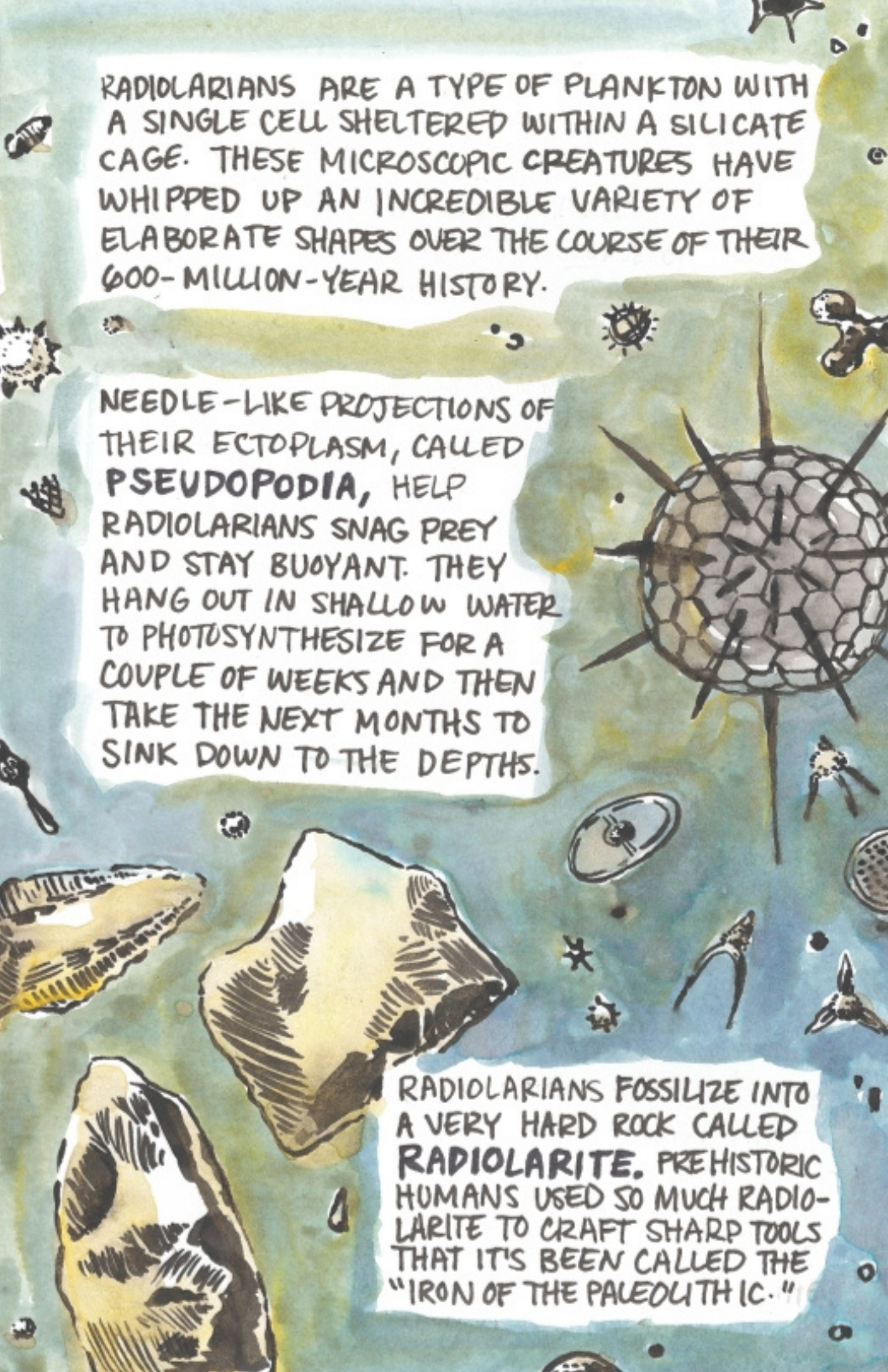
THOSE ARE THE CALCITE SHELLS—**TESTS**—OF SINGLE-CELLED ORGANISMS CALLED **COCCOLITHOPHORES** AND **FORAMINIFERA**. THESE TWO GROUPS ARE THE MAIN CONTRIBUTORS OF CARBONATE REMAINS TO CALCAREOUS OOZE.

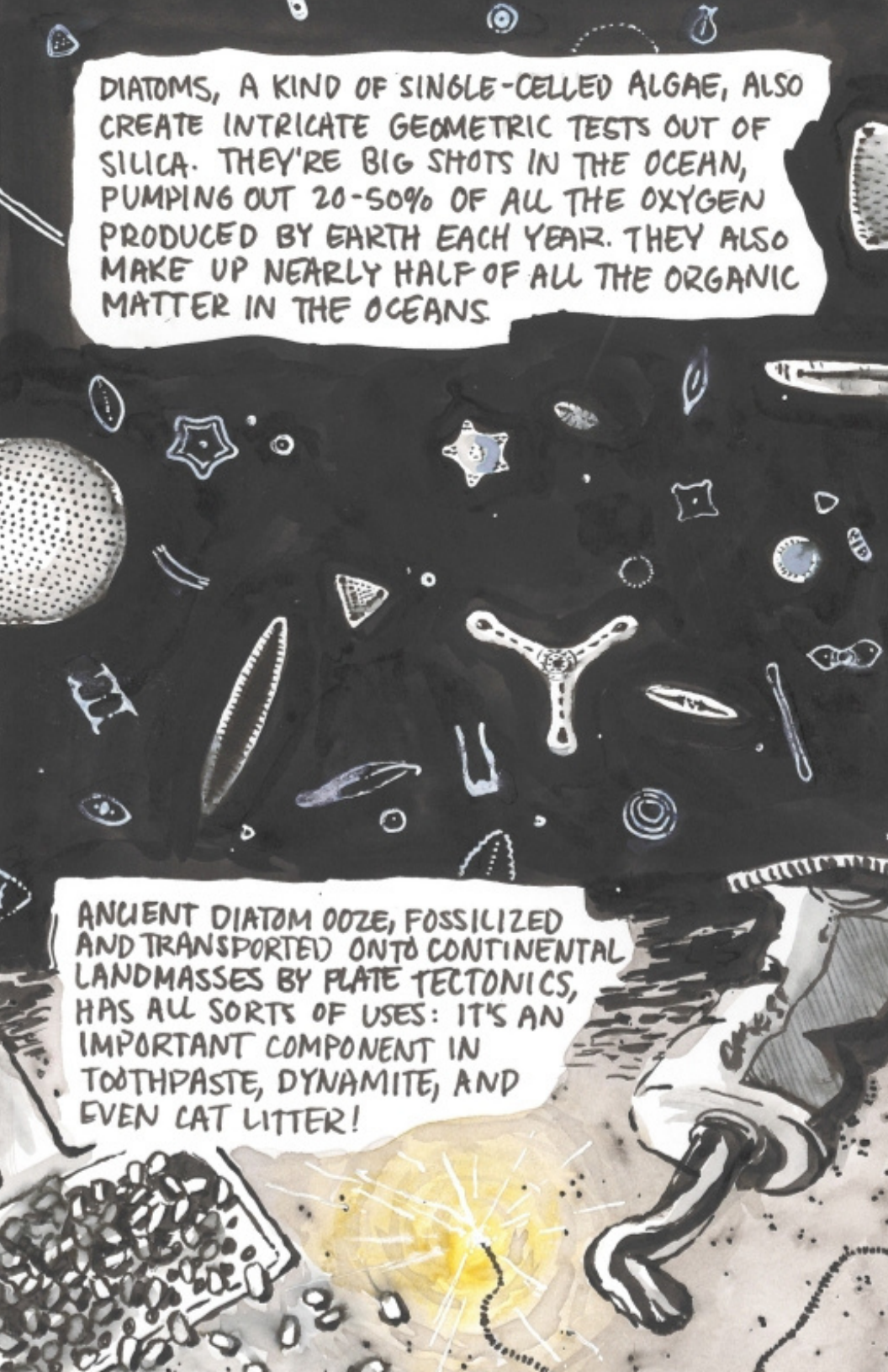

COCCOLITHOPHORES ARE A KIND OF SINGLE-CELLED PHYTOPLANKTON. THEY HANG OUT IN THE UPPER LAYERS OF THE OCEAN, SOAKING UP SUNLIGHT AND CHOWING DOWN ON NUTRIENTS TO POWER PHOTOSYNTHESIS. THESE TINY ORGANISMS SURROUND THEIR CENTRAL CELL WITH HUBCAP-SHAPED SCALES CALLED **COCCOLITHS.** WHEN COCCOLITHOPHORES KICK THE BUCKET, THEIR COCCOLITHS PILE UP ON THE OCEAN FLOOR.


FORAMINIFERA ARE A CATEGORY OF SINGLE-CELLED ZOOPLANKTON. MOST OF THEM SPORT CALCAREOUS TESTS, WHICH ARE USUALLY SPLIT INTO CHAMBERS AND GROW INTO ALL SORTS OF PATTERNS- SPIRALS, TUBES, SPHERES. AND THEY'RE TINY: ONLY THE SIZE OF A GRAIN OF SAND! MOST FORAMINIFERA ARE **BENTHIC**, SETTING UP SHOP ON THE SEAFLOOR SEDIMENT.
THEY MADE THEIR DEBUT IN THE FOSSIL RECORD IN THE CAMBRIAN ERA. THE GREEK HISTORIAN HERODOTUS DROPPED THE FIRST KNOWN REFERENCE TO THESE CRITTERS BACK IN THE 5th CENTURY BCE, NOTING THAT THEY MAKE UP THE LIMESTONE THAT FORMS THE GREAT PYRAMIDS OF GIZA.


THEY'RE NOT AS COMMON AS COCCOLITHOPHORES AND FORAMINIFERA IN THE SEDIMENTARY SCENE, BUT PTEROPOD REMAINS ALSO CONTRIBUTE TO CALCAREOUS OOZE.
THE TINY SHELLS OF SEA SLUGS AND SEA SNAILS RAIN DOWN ON THE OCEAN FLOOR — BUT ONLY IN SHALLOW WATER, SINCE THEIR UNSTABLE ARAGONITE EXOSKELETONS ARE EASILY DISSOLVED.


THE OTHER MAIN TYPE OF OOZE IS SILICEOUS, COVERING ABOUT 15% OF THE OCEAN FLOOR. IT'S MADE UP OF OPAL SILICA TESTS, WITH TINY PLANKTONIC DIATOMS AND RADIOLARIANS AS THE ARCHITECTS.
SILICA-BASED PLANKTON ARE MORE LIMITED IN DISTRIBUTION THAN THEIR CARBONATE COUNTERPARTS: THERE'S NOT MUCH SILICA IN THE WORLD'S OCEANS, SO THE EXTRACTION OF SILICA TO BUILD SHELLS AND SKELETONS TAKES A LOT OF ENERGY— MEANING THAT MORE NUTRIENTS ARE REQUIRED. SO, SILICEOUS OOZES TEND TO FORM UNDER UPWELLING ZONES IN THE EQUATORIAL AND POLAR REGIONS THAT CIRCULATE THESE TASTY NUTRIENTS TO THE CREATURES ABOVE.
SILICEOUS OOZE DOMINATES IN DEPTHS BELOW THE CCD, WHERE CALCAREOUS OOZE CAN'T REACH.


RADIOLARIANS ARE A TYPE OF PLANKTON WITH A SINGLE CELL SHELTERED WITHIN A SILICATE CAGE. THESE MICROSCOPIC CREATURES HAVE WHIPPED UP AN INCREDIBLE VARIETY OF ELABORATE SHAPES OVER THE COURSE OF THEIR 600-MILLION-YEAR HISTORY.
NEEDLE-LIKE PROJECTIONS OF THEIR ECTOPLASM, CALLED **PSEUDOPODIA,** HELP RADIOLARIANS SNAG PREY AND STAY BUOYANT. THEY HANG OUT IN SHALLOW WATER TO PHOTOSYNTHESIZE FOR A COUPLE OF WEEKS AND THEN TAKE THE NEXT MONTHS TO SINK DOWN TO THE DEPTHS.
RADIOLARIANS FOSSILIZE INTO A VERY HARD ROCK CALLED **RADIOLARITE.** PREHISTORIC HUMANS USED SO MUCH RADIOLARITE TO CRAFT SHARP TOOLS THAT IT'S BEEN CALLED THE "IRON OF THE PALEOLITHIC."


DIATOMS, A KIND OF SINGLE-CELLED ALGAE, ALSO CREATE INTRICATE GEOMETRIC TESTS OUT OF SILICA. THEY'RE BIG SHOTS IN THE OCEAN, PUMPING OUT 20-50% OF ALL THE OXYGEN PRODUCED BY EARTH EACH YEAR. THEY ALSO MAKE UP NEARLY HALF OF ALL THE ORGANIC MATTER IN THE OCEANS.
ANCIENT DIATOM OOZE, FOSSILIZED AND TRANSPORTED ONTO CONTINENTAL LANDMASSES BY PLATE TECTONICS, HAS ALL SORTS OF USES: IT'S AN IMPORTANT COMPONENT IN TOOTHPASTE, DYNAMITE, AND EVEN CAT LITTER!


UNIQUE TO THE UNDERWATER WORLD, OOZE IS A SALTY SLIME OF DEATH. IT SOLIDIFIES OVER TIME INTO ROCK FORMATIONS LIKE LIMESTONE AND CHERT THAT HOLD SECRETS OF THE OCEAN'S PAST.
THOUGH ITS COMPONENT CREATURES ARE MICROSCOPIC, OOZE IS LEAVING A COLOSSAL FOOTPRINT ON GEOLOGIC HISTORY.

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