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UA94/6/2/7 Physiography Notebook

Carl Ellis

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THE

ATLAS SCIENCE TABLET

FOR

Laboratory Notes and Drawings

....IN....

PHYSIOGRAPHY

School W. K. S. N. S. Year 1911

Pupil CARL E. ELLIS Room 22

Instructor PROF R. P. GREEN

Manufactured and Published by
ATLAS SCHOOL SUPPLY CO.
1024-1026 W. Van Buren Street
CHICAGO

TO THE INSTRUCTOR.

The plan of this note book has been suggested by the needs of the compilers. Most of the students who will use this book will be inexperienced in keeping notes. The experienced instructor knows how important it is that the *first* notes should be properly made. It is thought best therefore to make but few suggestions to the student about keeping his notes, and to leave it largely to the individual instructor to give the proper directions before the student uses the different parts of this book. Blanks for Astronomical and Weather observations, outline maps and weather maps, section paper and drawing paper are provided, with the idea that some instructors will make more use of them than others. It is designed to satisfy the smaller demand by providing for the larger. It is hoped that by filling out the table of contents in his own note book, and making an index of the subjects on which he has written, the student will acquire the habit of using these useful parts of all books, and will at the same time make his notes available when wanted.

SUGGESTIONS TO THE STUDENT.

In writing a paper for the note book, the student should form the habit—1st: Of placing in the upper right hand corner of each sheet, (a) his name,

(b) the date,

(c) the subject Physical Geography, and

the hour or period of recitation.

2d: Of placing on the first line of the first page the title of the paper which is to follow.

If the paper is a summary of a topic to which considerable study has been given, it is well for the student to write out a plan or list of the particular parts of the subject which it is thought should be treated, and to arrange these parts in the order best to make the subject clear. By thus thinking through the subject before writing, questions may arise which it will be found desirable to look up before attempting to write.*

Sketches, maps and diagrams may always properly accompany a paper. Their purpose is to help the reader understand the subject, or to aid the writer to make his thoughts clear. Care should be taken that the drawings are properly labeled in order that the reader may understand what they are designed to represent, and especial care should be taken that the particular parts which are essential to an understanding of the illustrations are clearly labeled.

In making the illustrations the student should exercise his ingenuity in planning devices which shall bring out the essential points in the illustration and not obscure these points by too much shading or too great similarity in devices used to represent different things.

No paper should be passed in to the instructor without previous revision. The student should read the paper carefully to be sure that he has expressed his ideas clearly, and correct mistakes in spelling and in grammar which are as often due to carelessness as to ignorance.

On the return of the paper by the instructor, the student should read it through and criticise it and make any changes which his increased knowledge will enable him to make. Corrections or changes suggested by the instructor should be made immediately and the paper should then be marked, "Revised", in the upper left hand corner of the first sheet, with the date of revision. The paper should then be filed in the note book or returned to the instructor according to his directions. No paper should be permanently filed without the instructor's "O K" of approval.

One of the desirable things the student should acquire in keeping a note book is the habit of neatness and system in arranging his papers so that their contents shall be available when wanted. To assist in this a blank table of contents is provided in the front of this book and a subject index in the back of the book. Whenever a subject is written up and the paper has been approved by the instructor, it should be filed in the note book and the proper page number placed on it. Then the title of the paper should be written in the table of contents with the correct reference to the number of the page of the note book bearing that title. In addition, the subjects treated of in the paper should be indexed under the proper subjects in the index in the back of the book. Subjects not in the printed index may be written between the lines in the proper place.

THE ATLAS NOTE BOOK

FOR

PHYSIOGRAPHY.

WITH SUGGESTIONS, MAPS AND DIAGRAMS

Arranged by

CHARLES EMERSON PEET,
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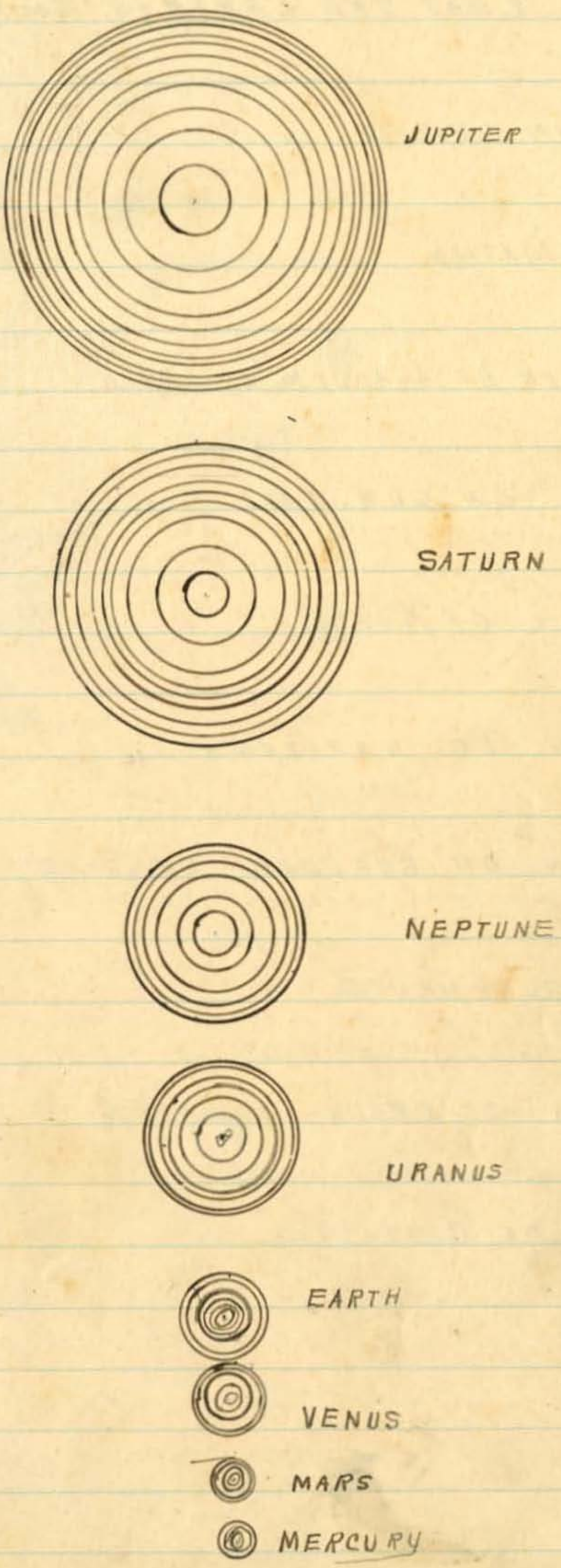
RALPH E. BLOUNT,
Robt. A. Waller High School, Chicago.

CHICAGO
ATLAL SCHOOL SUPPLY CO.
1909

CONTENTS.

THE PLANETS ARRANGED ACCORDING TO THEIR SIZE



PROOFS THAT THE EARTH is ROUND

1 OBERSAVATION OF SHIP

2 CIRCUMNAVIGATION

3. OBERSAVATION OF SHADDOW ON MOON

4 DIFFERENCE OF SUN TIME

5 OBERSAVATION OF STARS

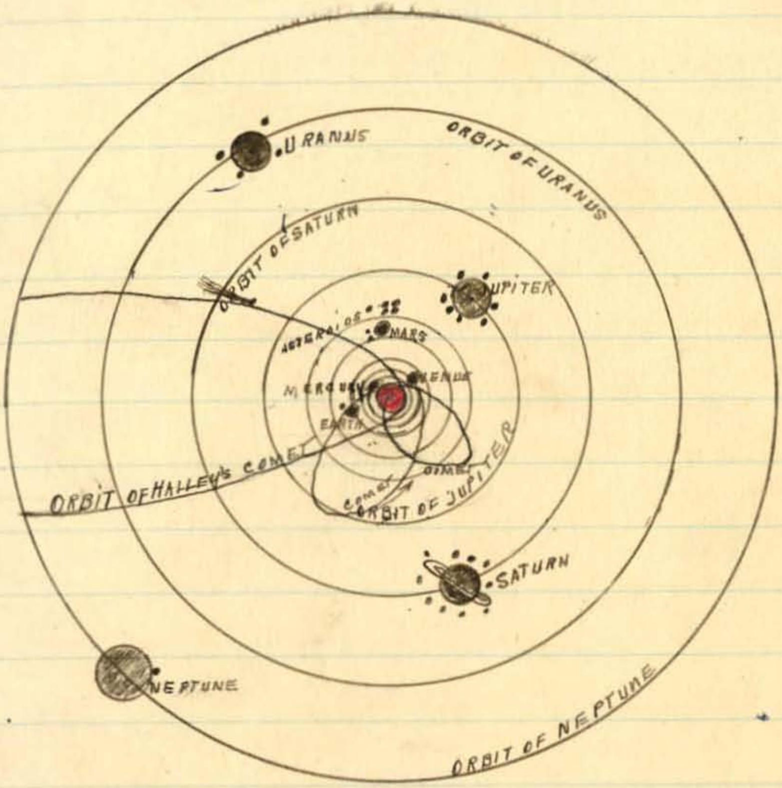
6 OBERSAVATION OF HORIZON

7. OBERSAVATION OF SHADDOW OF POST

8 ACTUAL MEASUREMENTS

9 OBERSAVATION OF OTHER PLANETS

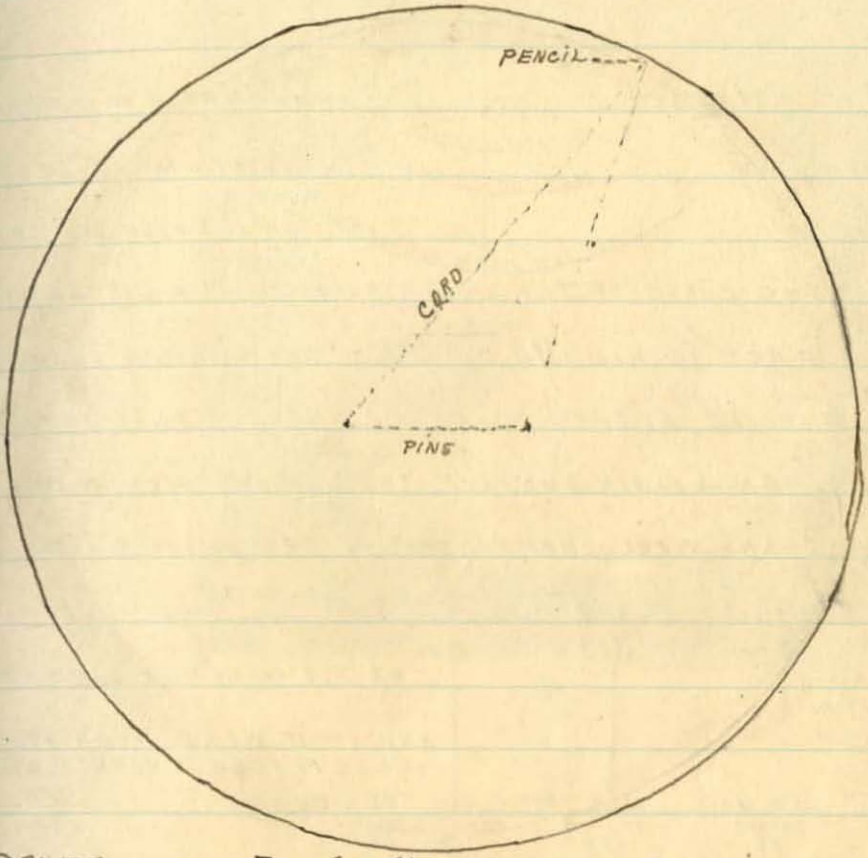
10 UNIFORMITY OF GRAVITY



THE SOLAR SYSTEM FROM REDWAY PAGE 11.
THE SPACE WITHIN THE ORBIT OF JUPITER SHOWS THE RELATIVE SIZE OF THE SUN

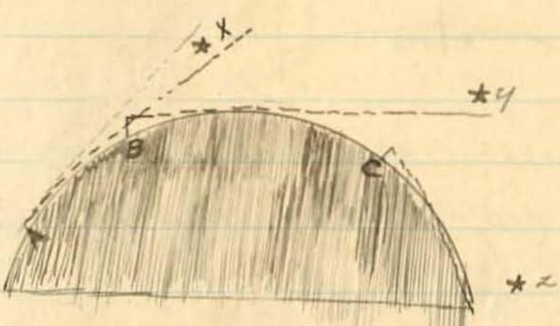
MARS	HAS	2	SATELLITES
JUPITER	"	7	"
URANUS	"	4	"
SATURN	"	10	"
NEPTUNE	"	1	"
EARTH	"	1	MOON

THE EARTH IS ABOUT 240 MILES FROM; THE SUN IS THE GREATEST CENTRAL BODY OF THE SOLOR SYSTEM IS ABOUT 1.330.000 TIMES THE SIZE OF THE EARTH. AND IS THE LARGEST SELF LUMINIOUS BODY IN THE HEAVENS.



DRYER

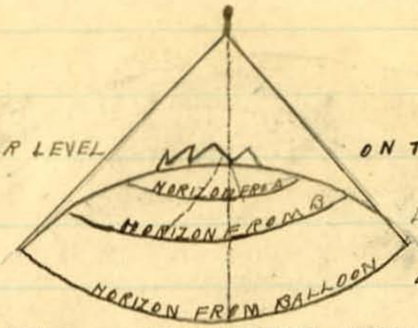
FIC. 8. - HOW TO DRAW AN ELLIPSE



FIC. 9. DRYER

A. CAN SEE THE STAR X, BUT NOT Y, AND Z, WHILE A PERSON AT C CAN SEE ALL THREE OF THE STARS. HENCE THE SURFACE OF THE EARTH ALONG A NORTH AND SOUTH LINE IS CURVED

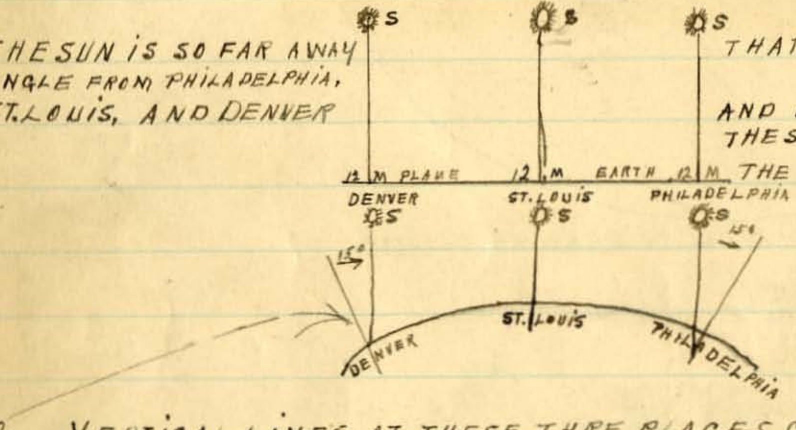
Fic 1. DRYER



EXPANATION.

WHEN VIEWED FROM THE WATER LEVEL ON THE SHORE OF THE OCEAN OR OF ANY BODY OF WATER SEVERAL MILES ACROSS, THE LOWER PART OF SHIP OR A HOUSE OR TREE IS HIDDEN BEHIND THE CURVE OF THE WATER SURFACE. AT A DISTANCE OF ONE MILE THE OBJECT IS HIDDEN TO THE HICHT OF EIGHT INCHES AT TWO MILES 32 INCHES AT THRE MILES 72 INCHES THIS IS TRUE ALSO UPON LAND. ON A PLAIN SURFACE THE HORISON WOULD BE AT AN INDEFINITE DISTANCE AND WOULD NOT RETREAT AS THE OBSERVER ASCENDS

Fic. 2. DRYER



THE SUN IS SO FAR AWAY
ANGLE FROM PHILADELPHIA,
ST. LOUIS, AND DENVER

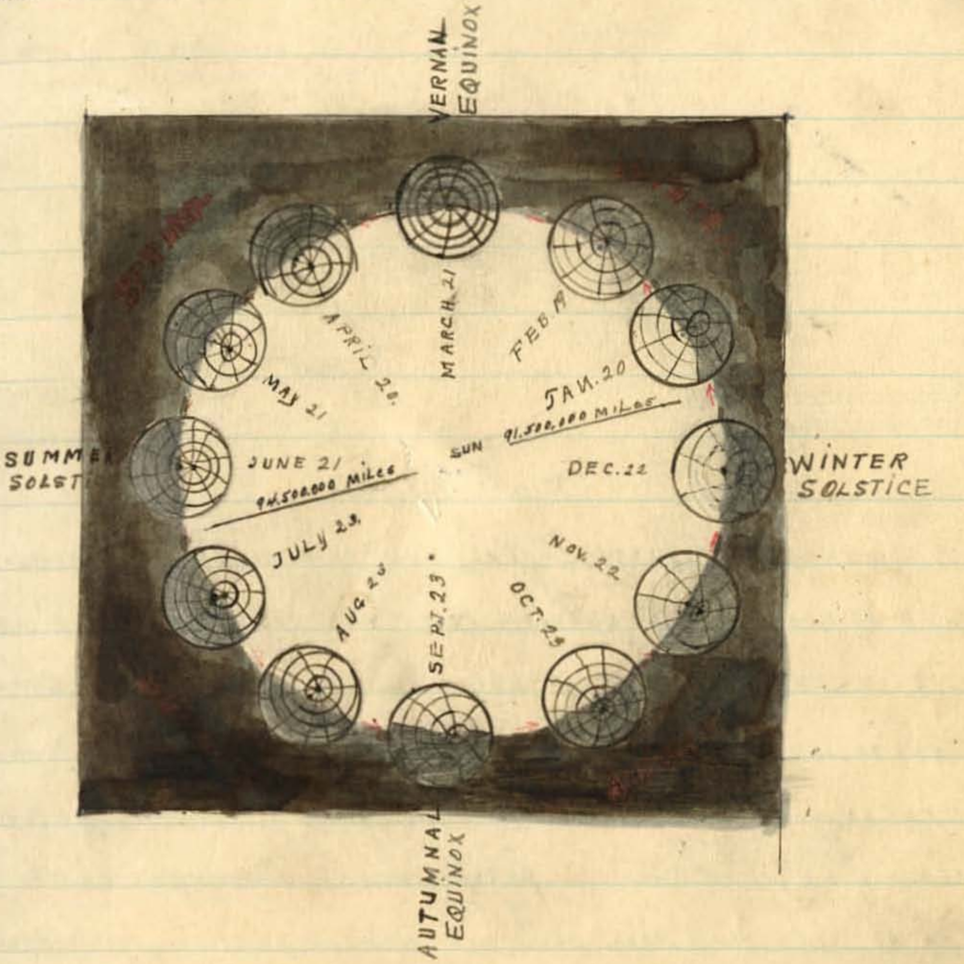
THAT IT WOULD APPEAR AT THE SAME

AND IF IT WERE NOON AT ONE OF
THESE PLACES IT WOULD BNOON AT
THE OTHERS.

2. VERTICAL LINES AT THESE THRE PLACES CONVERG DOWNWARD. THEREFO THE SURFACE OF THE EARTH ALONG AN EAST AND WEST LINE IS CURVED

DRYER.

FIG. 10. - POSITION OF THE NORTHERN HEMISPHERE THROUGHOUT THE YEAR



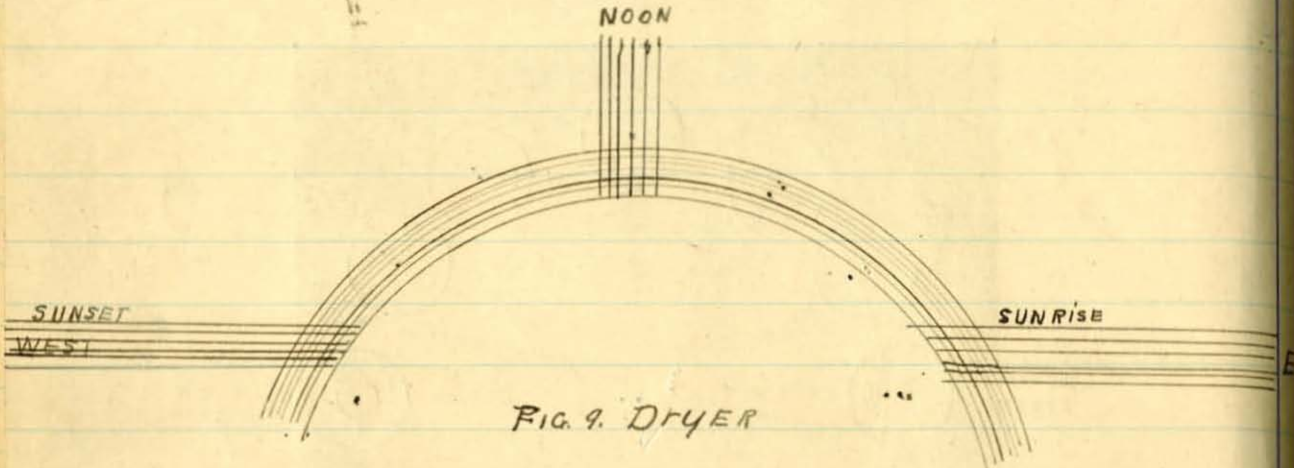
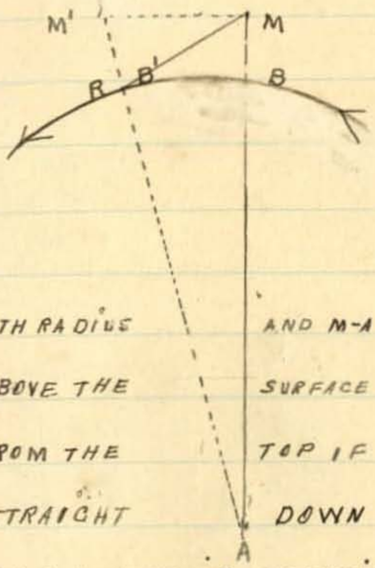


FIG. 9. Dryer

THE CHANGE OF SEASONS. - THAT THE SUN'S RAYS HAVE GREATER HEATING POWER AT NOON THAN AT MORNING OR EVENING IS ONE OF THE MOST FAMILIAR FACTS IN NATURE. THIS IS DUE CHIEFLY. TO TWO CAUSES, SHOWN IN FIG. 9. AT SUNRISE AND SUNSET, THE RAYS, BEING HORIZONTAL, PASS THROUGH A GREATER THICKNESS OF AIR, WHICH ABSORBS MORE OF THEIR ENERGY, AND THEY ARE SPREAD OVER MORE SURFACE, SO THAT THERE IS LESS HEAT TO THE SQUARE MILE. AT NOON, THE RAYS, BEING MORE NEARLY VERTICAL, PASS THROUGH LESS AIR AND COVERS LESS SPACE, WHICH MAKES THE HEAT MORE INTENSE.

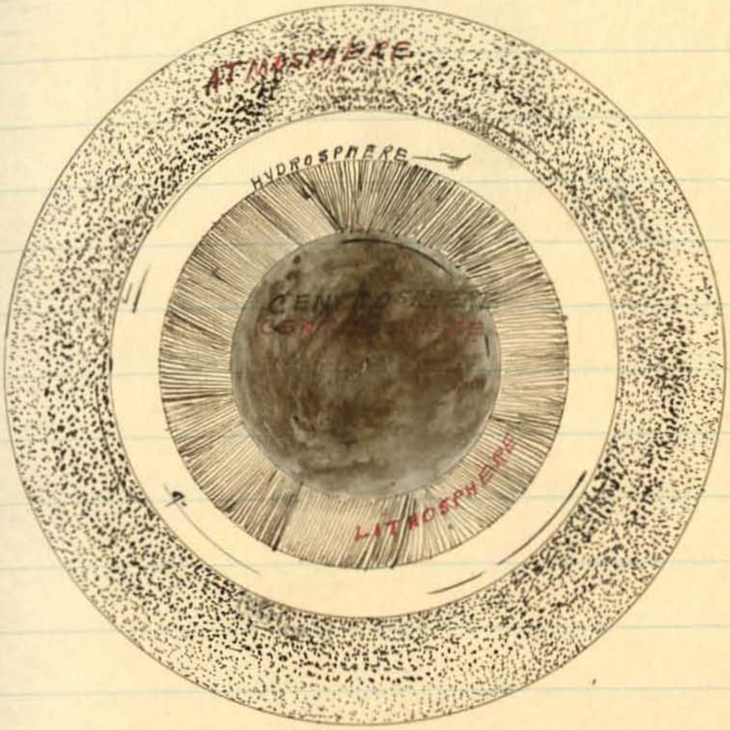
FIGURE 345. SALSBURY PAGE 301.



LET AB=THE EARTH RADIUS AND M-A POINT ON A TOWER [HIGHT GREATLY exaggerated] ABOVE THE SURFACE OF THE EARTH'S. SUPPOSE THE MASS M IS DROPPED FROM THE TOP IF THE EARTH WERE NOT ROTATING IT WOULD FALL STRAIGHT DOWN AN WOULD STRIKE THE SURFACE AT B. SUPPOSE THE EARTH IS ROTATING AT SUCH A RATE THAT BA TURNS TO B'A WHILE M IS FALLING TO THE SURFACE IF IT WERE NOT FAR THE ATTRACTION OF THE EARTH M WOULD GO IN A STRAIGHT LINE TO M' THE ATTRACTION OF THE EARTH IS AT RIGHT ANGLES TO THIS LINE (M M') IT DOES NOT CHANGE THE AMOUNT OF MOTION OF M TOWARD M', BUT IT GIVES IT ANOTHER MOTION TOWARD THE EARTH. THE RESULT IS THAT IT DESCRIBES THE CURVED LINE MR. AND STRIKES THE EARTH AT R A LITTLE BEYOND THE FOOT OF THE PERPENDICULAR M'B. IF THE EARTH TO THE WEST, THE BODY WOULD ~~FALL~~ ROTATE THE OTHER WAY. SINCE THE BODY ALWAYS FALLS TO THE EAST AND SINCE THE BODY ALWAYS FALLS TO THE EAST AND NOTHING BU THE ROTATION OF THE EARTH TO THE EAST WILL EXPLAIN THE FACT. IT IS TAKEN AS A PROOF THAT THE EARTH ROTATES IN THAT DIRECTION

FIG. 13 DRYER SECTION OF PART OF THE EARTH

THE HYDROSPHERE IS THE LIQUID S



THE EARTH IS DIVIDED INTO FOUR PARTS OR SPHERES

1. CENTROSPHERE IS THE CORE OR INTERIOR MASS OF THE EARTH

2. THE ROCKSPHERE OR LITHOSPHERE IS THE SOLID CRUST OF THE EARTH FORMING THE LAND MASSES AND THE SEA BOTTOM

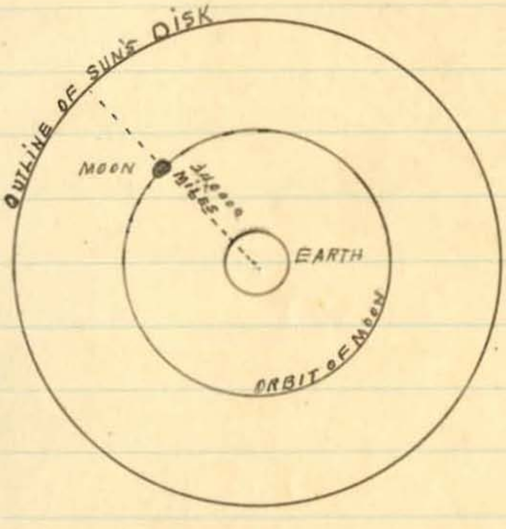
3. THE WATERSPHERE OR HYDROSPHERE IS THE LIQUID SHELL OF SEA WATER WHICH OCCUPIES THE DEPRESSIONS

4. THE ATMOSPHERE IS THE GASEOUS SHELL OR AIR WHICH FORMS THE OUTER LAYER OF THE EARTH

RELATIVE LENGTH OF DAY AND NIGHT   REDWAY PAGE 18.

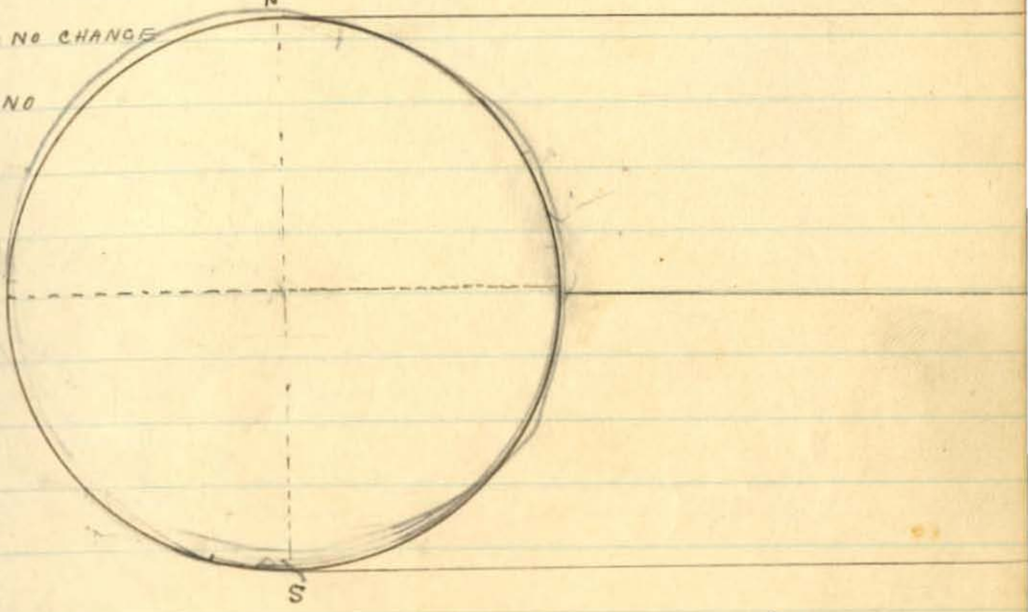
The shaded part of each parallel shows the length of the night; the unshaded part, the parportionate length of the day.

DIAGRAM FROM MURY SIMONDS. SHOWING THE COMPARATIVE SIZES OF THE EARTH, THE ORBIT OF THE MOON AND THE SUNS DISK



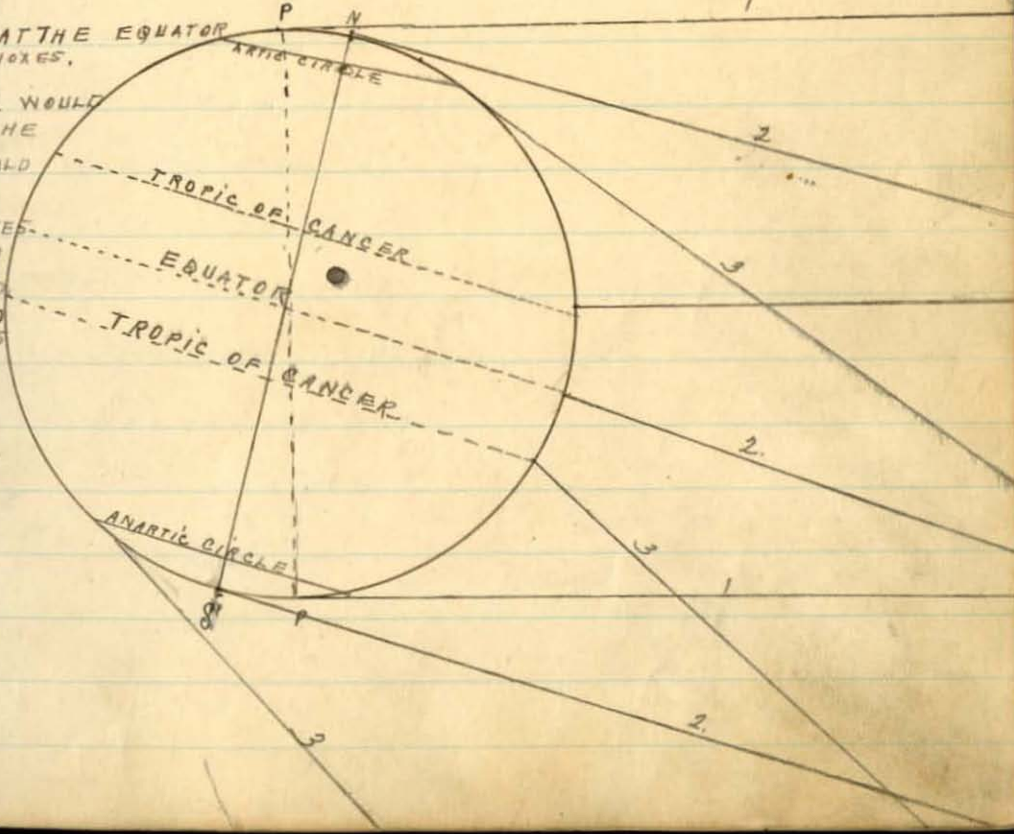
IF THE EARTH WERE PERPENDICULAR TO ITS ORBIT DAY'S AND NIGHTS WOULD BE = AT ALL TIMES EVERY WHERE EQUAL

THERE WOULD BE NO CHANGE OF SEASONS AND NO ZONES

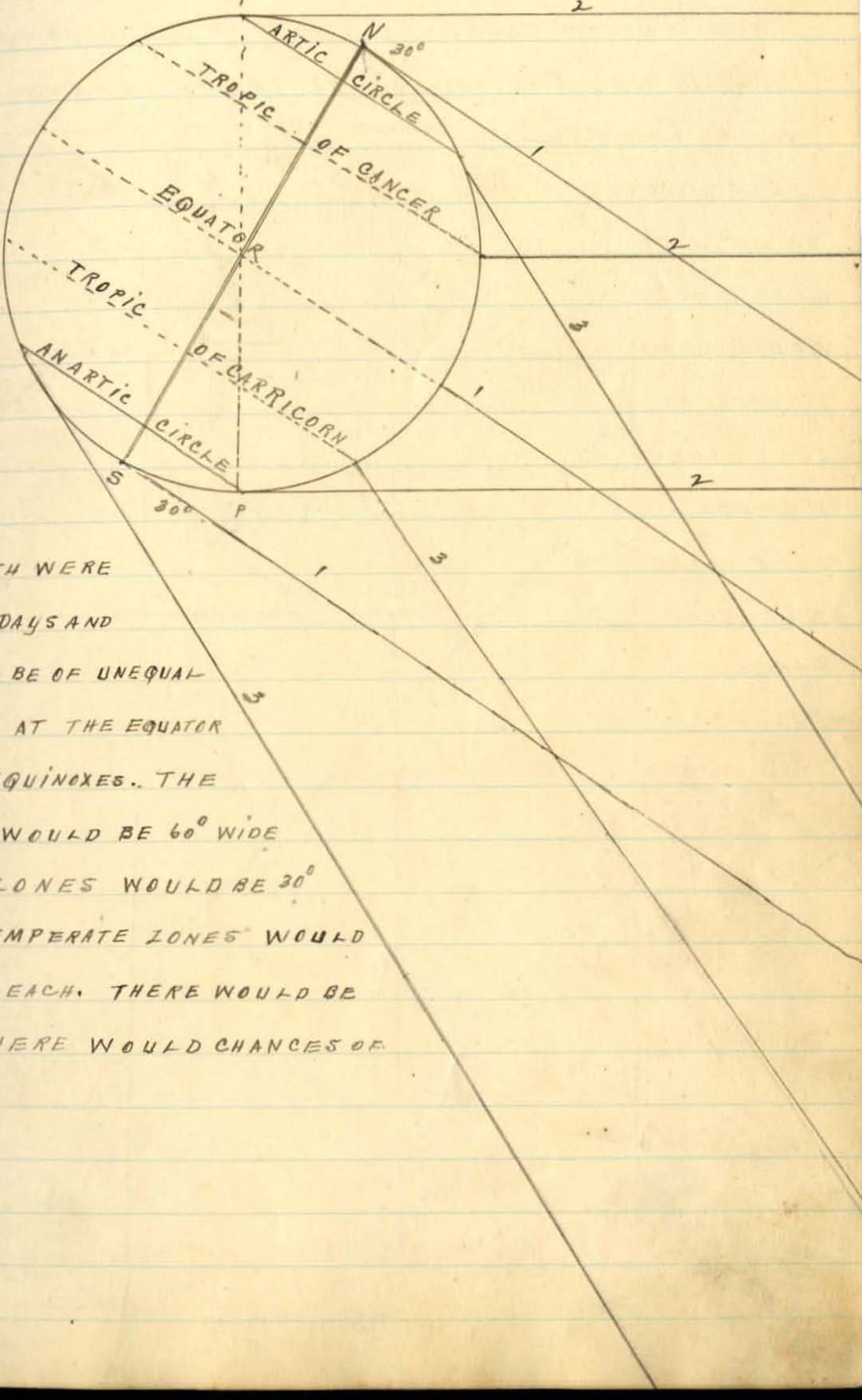


IF THE EARTH WERE INCLINED 15° DAY'S AND NIGHTS WOULD BE OF UNEQUAL LENGTH EXCEPT AT THE EQUATOR AND DURING EQUINOXES.

THE TORID ZONE WOULD BE 30° WIDE AND THE FRIGID ZONES WOULD EACH BE 15° WIDE THE TEMPERATE ZONES WOULD EACH BE 60° WIDE THERE WOULD BE FIVE ZONES AND CHANGE OF SEASONS



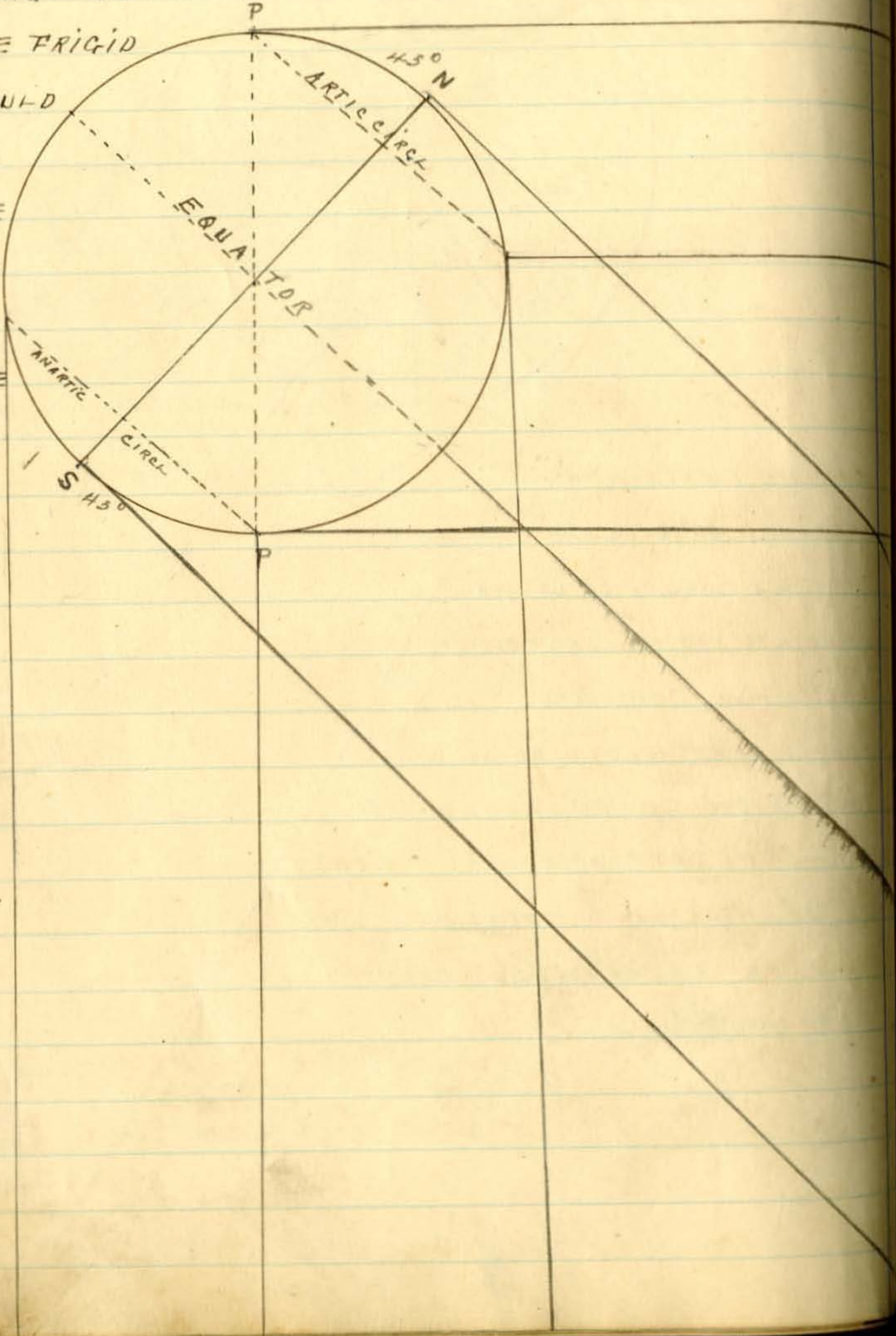
IF THE EARTH WERE INCLINED 30°



IF THE EARTH WERE INCLINED 30° DAYS AND NIGHTS WOULD BE OF UNEQUAL LENGTH EXCEPT AT THE EQUATOR AND DURING EQUINOXES. THE TORRID ZONE WOULD BE 60° WIDE THE FRIGID ZONES WOULD BE 30° EACH. THETEMPERATE ZONES WOULD BE 30° WIDE EACH. THERE WOULD BE 5 ZONES THERE WOULD CHANCES OF SEASONS

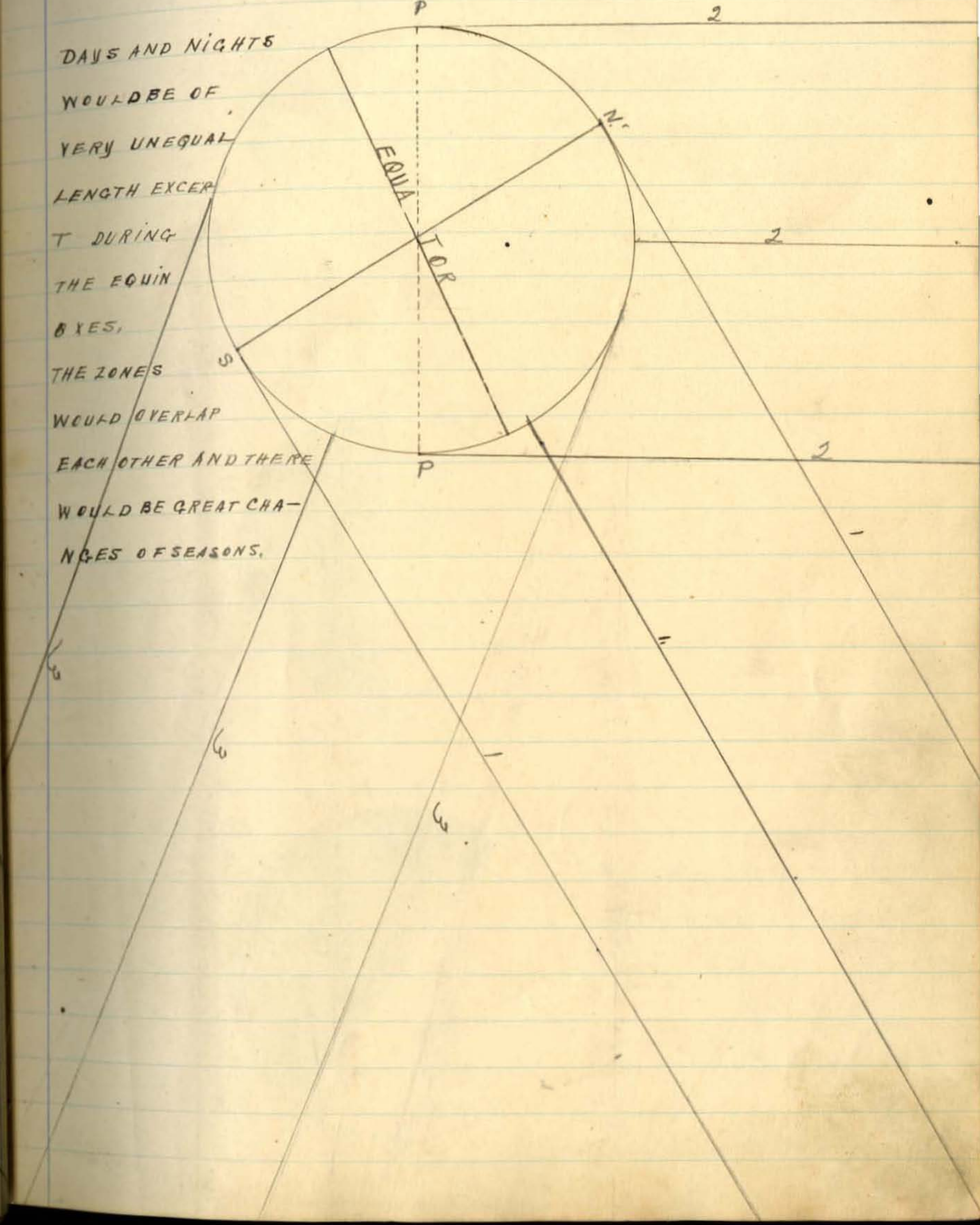
DRAWING REPRESENTING THE EARTH AT AN ANGLE OF 45°

IF THE EARTH WERE INCLINED 45° DAYS AND NIGHTS WOULD BE OF UNEQUAL LENGTH EXCEPT AT THE EQUATOR AND DURING EQUINOXES. THE TORRID ZONE WOULD BE 90° WIDE THE FRIGID ZONES WOULD BE 45° WIDE EACH. THERE WOULD BE NO TEMPERATE ZONE. THERE WOULD BE THREE ZONES AND A GREAT CHANGE OF SEASONS.

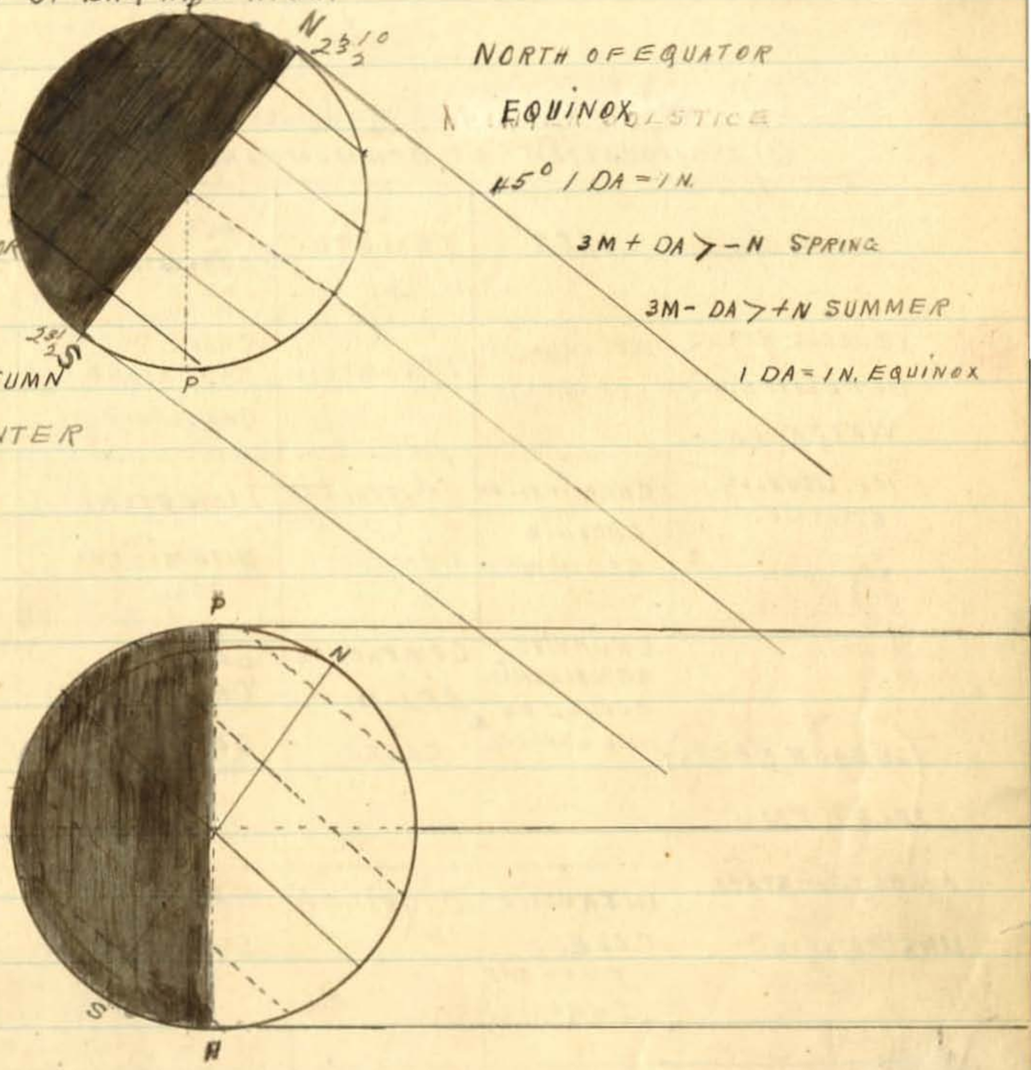


IF THE EARTH WERE INCLINED 60°.

DAYS AND NIGHTS WOULDBE OF VERY UNEQUAL LENGTH EXCEPT DURING THE EQUINOXES, THE ZONES WOULD OVERLAP EACH OTHER AND THERE WOULD BE GREAT CHANGES OF SEASONS.



LENGTH OF DAY AND NIGHT



NORTH OF EQUATOR

EQUINOX

45° 1 DA = 1 N.

3M + DA > - N SPRING

3M - DA > + N SUMMER

1 DA = 1 N. EQUINOX

SOUTH OF EQUATOR

1 DA = 1 NIGHT

3M + N > - D AUTUMN

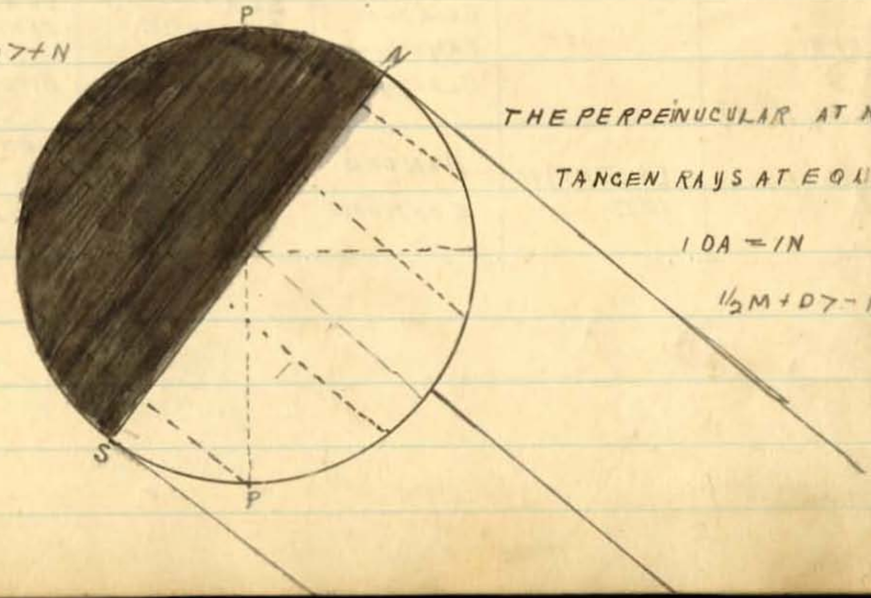
3M - N > + D WINTER

1 DA = 1 N

1½ m + D > - N

3½ DA

½ M - D > + N



THE PERPENUCULAR AT N POLE

TANGEN RAYS AT EQUATOR

1 DA = 1 N

½ M + D > - N

CLASSIFICATION OF COMMON AND TYPICAL ROCKS

ORIGIN	CLASS	TEXTURE	BED ROCK CONSOLIDATED	MANTLE ROCK UNCONSOLIDATED
AQUEOUS ROCKS DEPOSITED BY WATER OR ICE. USUALLY STRATFIED	MECHANICAL SEDIMENTS	FRAGMENTAL	SHALE SANDSTONE CONGLOMERATE	CLAY SAND GRAVEL
	CHEMICAL OR ORGANIC SEDIMENTS	CRYSTALINE COMPACT	LIMESTONE BITUMINOUS COAL	MARL PEAT
IGNEOUS ROCKS COOLED FROM A MELTED STATE UNSTRATIFIED	ERUPTIVE OR VOLCANIC. COOLED ON THE SURFACE	COMPACT OR CRYSTALLINE CLASSY	BASALT TRAP (LAVA] OBSIDIAN. PUMICE	
	INTRUSIVE COOLED BELOW THE SURFACE	CRYSTILLEINE	GRANITE SYENITE	
			ROCK NAME	ORIGINAL FORM
METAMORPHIC ALTERED BY HEAT AND SRESSURE	STRATIFIED	SLATY COMPACT CRYSTALLINE CLASSY	SLATE QUARTZITE MARBLE ANTHRACITE COAL	SHALE SANDSTONE LIMESTONE BITUMINOUS COAL.
	UNSTRATIFIED	BANDED SCHISTOSE	GNEISS MICA SCHIST	CONGLOMERATE OR GRANITE. SHALE OR GRANITE

1. MANTLE ROCK
    - 1. CLAY 2 SAND
    - 3. GRAVEL 4. PEBBLES
    - 5. BOULDERS 6. PEAT
    - 7 MARL 8 SOIL

2. BED ROCK
    - 1 LIMESTONE
    - 2. SHALE
    - 3 SANDSTONE
    - 4 BITUMINOUS COAL
    - 5. CONGLOMERATE
    - 6 FLINTS

3. IGNEOUS ROCK
    - 1 LAVA 2 GRANITE
    - 3 BASALT 4. QUARTS
    - 5 MICA 6. SYENITE
    - 7. SLATE 8. MARBLE
    - 9 ANTHRECITE COAL

BIOSPHERE.
- BOTANY
- ZOOLOGY
- ANTHROPOLOGY
- BIOLOGY
- PHYSOLOGY

SCHYSPHERE
- ECONOMICS
- HISTORY

LITHOSPHERE
- MINEROLOGY
- GEOLOGY
- PLANATOLOGY
- PETROLOGY

HYDROSPHERE
- HYDROLOGY
- OCEANOLOGY

ATHESPHERE
- CLIMATOLOGY
- METEROLOGY

1. MATHIMATICAL GEOGRAPHY

2. GEOLOGY AND MINEROLOGY PETROL

3. HYDROLOGY OCEANOLOGY

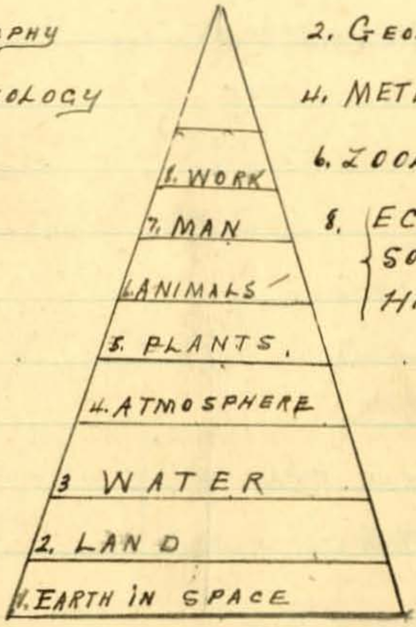
4. METEROLOGY CLIMATOLOGY

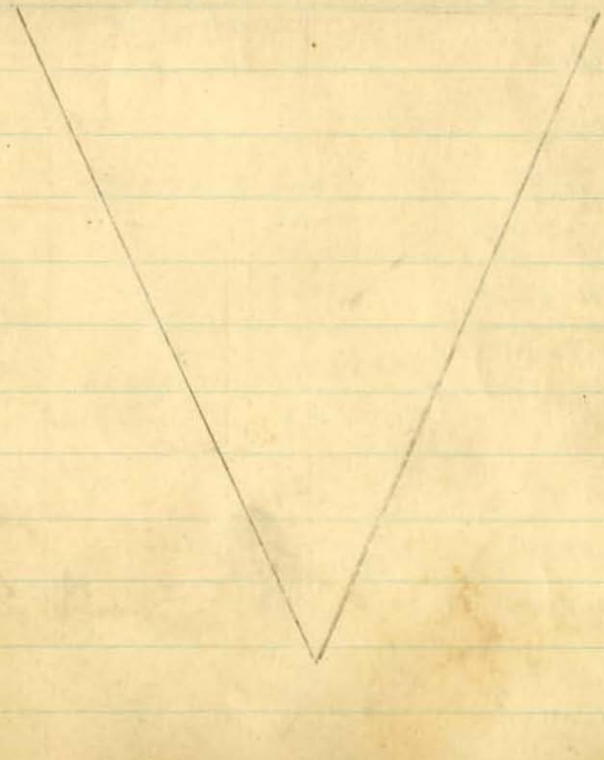
5. BOTANY

6. ZOOLOGY

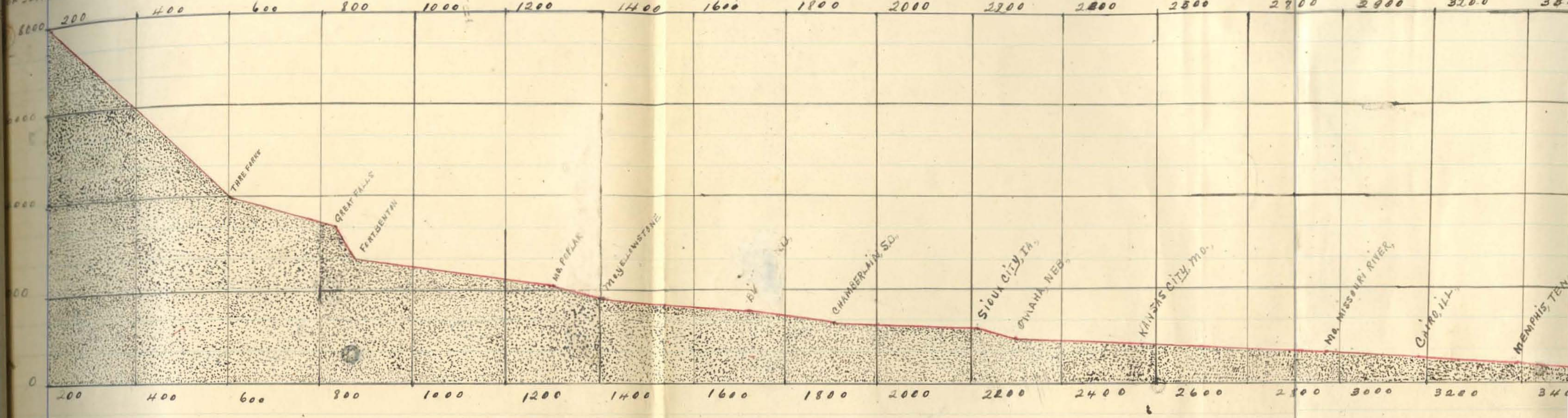
7. ANTHOPOLOGY

8. ECOMICS
   SOCOLOGY
   HISTORY

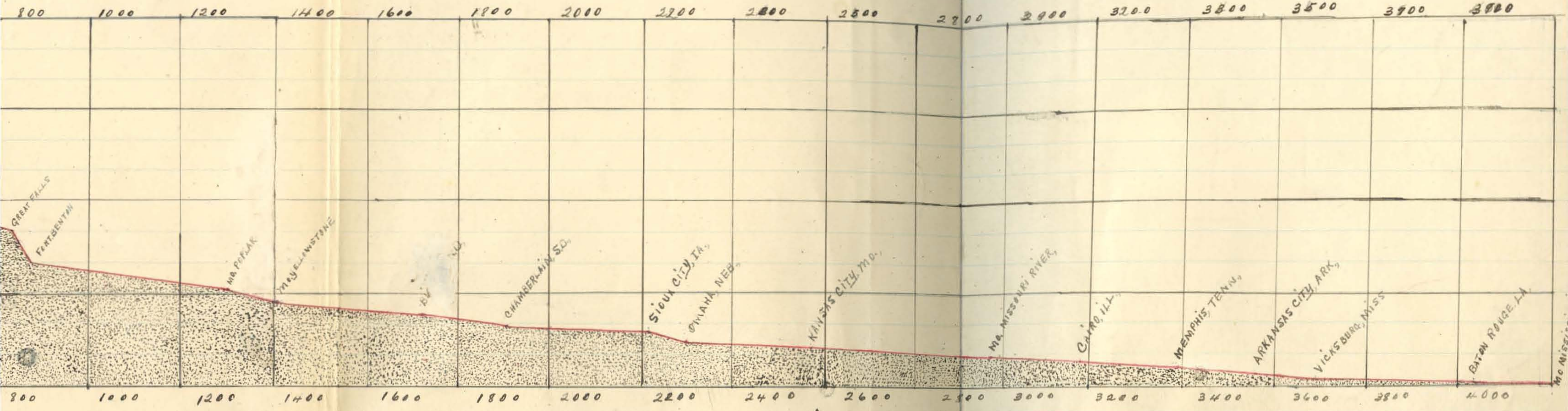




PROFILE OF Mississippi–Missouri River SYSTEM

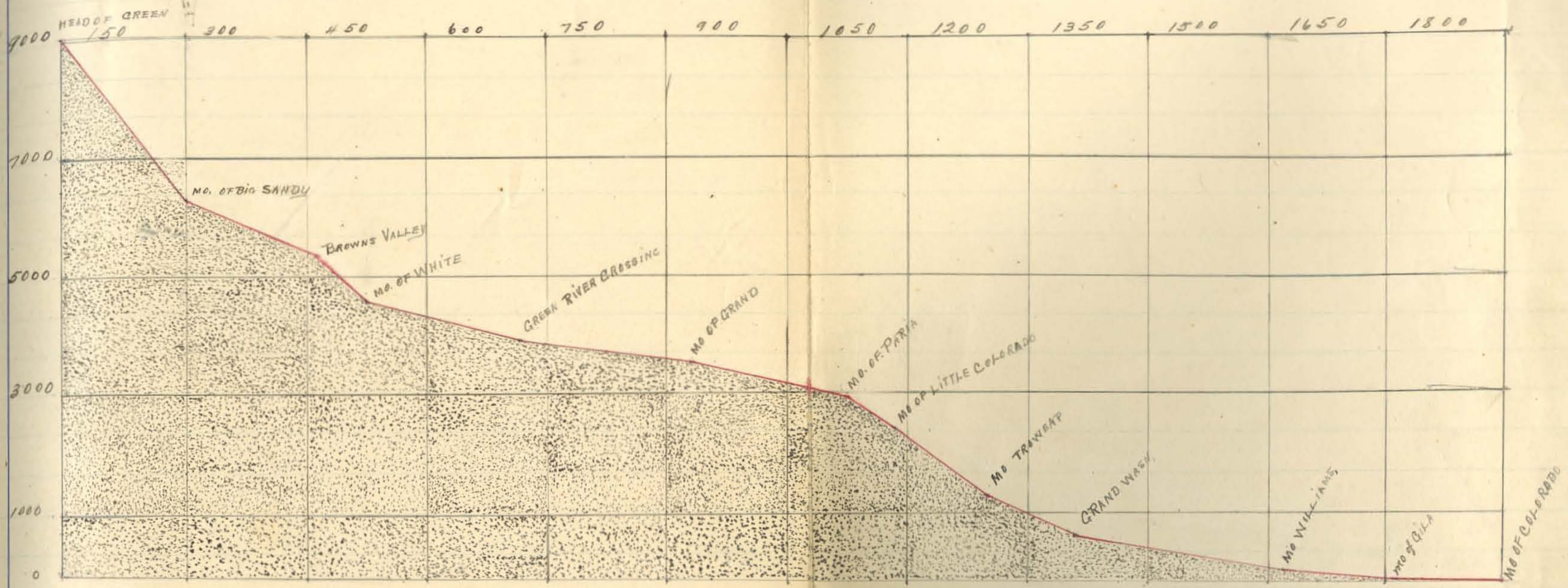


sissippi–Missouri River System



CARL E ELLIS.

PROFILE OF GREEN-COLORODO RIVER SYSTEM



PROFILE OF ST. LAWRENCE RIVER SYSTEM

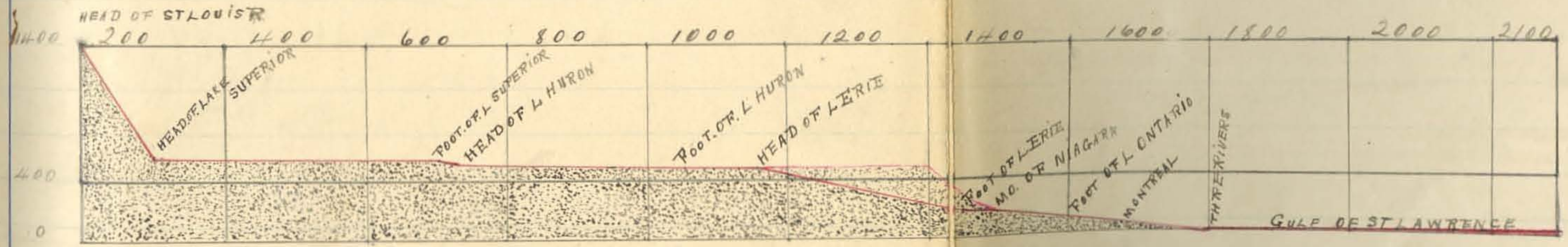
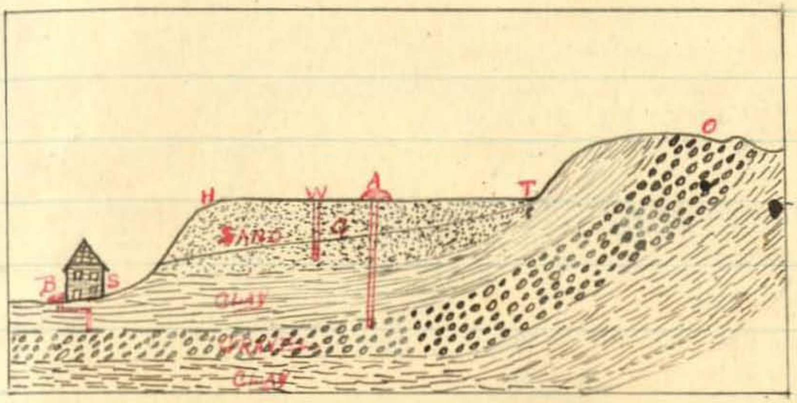


Fig 67 DRYER



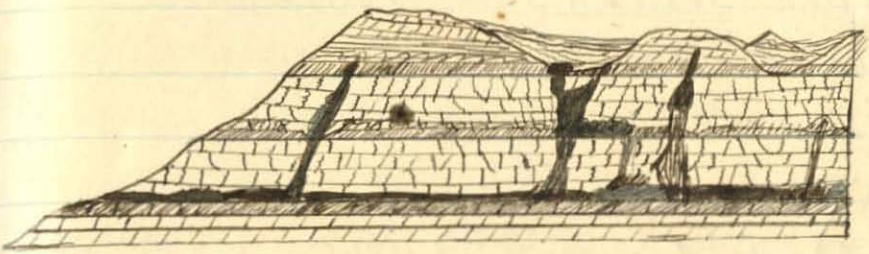
EXPLANATION. THE RAIN FALLING ON THE SURFACE H.T. PEAETRATES THROUGH THE SAND UNTIL IT REACHES THE SURFACE OF THE CLAY BENEATH, AND MOVES SLOWLY TOWARDS ITS LOWEST POINT S. BUT IT STANDS HIGHER IN THE SAND THAN THE LEVE OF THE TOP OF THE CLAY, BECAUSE A CERTAIN PRESSURE IS NECESSARY TO OVERCOME FRICTION AND FORCE THE WATER THROUGH THE SAND. THE LOWEST LEVEL OF GROUND-WATER IS AT A HEIGHT WHERE THE RESISTANCE DUE TO FRICTION JUST COUNTERBALANCES THE PRESSURE DUE TO THE ACCUMULATED WATER. SINCE THE FRICTION INCREASES WITH THE DISTANCE WHICH THE WATER HAS TO FLOW THROUGH THE SAND TO ITS POINT OF ESCAPE, IT WILL HOLD THE WATER UP TO A HIGHER LEVEL BELOW T THAN BELOW H. THERE WILL BE A SPRING AT S. A WELL SUNK DOWN AT W DOWN TO G. WILL STRIKE WATER BOTH SPRING AND WELL WILL BE UNFAILING IF THE RAINFALL IS SUFFICENT TO SUPPLY THE OUTFLOW FROM THEM. IF A PERMABLE STRATUM, AS GRAVEL, LIES BELOW AN IMPERMEABLE STRATUM, AS CLAY, AND RECEIVES RAIN UPON ITS OUTCROPING SURFACE, AS AT O, IT MAY BECOME FILLED WITH WATER UP TO THE LEVEL OF O. THEN IF A WELL STARTING AT A LOWER LEVEL, AS AT A OR B IS SUNK UNTIL IT TAPS THE WATER-BEARING GRAVEL, THE WATER

WILL RISE ABOVE THE MOUTH OF THE OPENING, AND A FLOWING OR ARTESIAN WELL WILL BE OBTAINED. IN A BORING AT B THE PRESSURE WILL BE SUFFICENT TO RAISE THE WATER TO THE TOP OF A HOUSE OR TO MAKE A FOUNTAIN.

AGENTS OF EROSION

- 1 WIND
  - SAND DUNES
  - LAESS
- 2. GLACIERS
  - ESKERS
  - DRUMLINS
  - KAMES
  - DRIFT
  - MORAINES
  - OUT WASHED PLAINES
- 3 GRAVITY
  - LAND SLIDES
  - TALUS
- 4 RUNING WATE
  - 1 ALLUVIALS PLAINS AND FLOOD PLAINES
  - 2 DELTAS 3. COSTAL SHELF
  - 4 ALLUVIAL CONES
  - 5 ALLUVIAL FANS
  - LOCUSTRINE PLAINS
  - ALKI PLAINS
- 5 UNDERGROUND WATER
  - VAINS
  - STALACTITES AND STALAGMITES
  - COLUMNS PILLARS
  - 3 TURFA - TRAVERTINE DEPOSIT
  - GEYSERS
- 6 OCEAN
  - OOZE
  - COSTAL SHELF
  - STRATIFIED ROCK
  - SAND BARS
  - SPLITS
  - HOOKS
  - BEACHES
- 7. LIFE

FIG 69 DRYER SECTIONS OF CAVES



EXPLANATION IN SOME LIMESTONE REGIONS THE DRANAGE IS WHOLLY SUBTERRANEAN AND THE EARTH-CRUST IS HONEYCOMBED WITH TORTUOUS PAGES AND TUNNELS WHICH FREQUENTLY WIDEN INTO LARGE AND LOFTY CHAMBERS OR CAVES. THE SURFACE OF SUCH A REGION IS PITTED WITH FUNNEL-SHAPED DEPRESSIONS OR SINKHOLES WHICH HAVE NO OUTLET EXCEPT AT THE BOTTOM

RELEAF MEANS **ELEVATION.**

- RELIEF
  - 1. ORDER OCEAN BASIS AND CONTINENTIAL BLOCK
  - 2. ORDER DEVISON INTO MOUNTAINS PLAINS AND PLATAUS
  - 3. RELIEF RESULTING FROM EROSION

A RELIEF MAP IS A MODEL A MODEL IS A REPRODUCTION OR MODEL IS A MINITURE REPRODUCTION OF THE EARTH OR SOME PART

- 1. DENEDATION
  - WEATHERING
    - OXIDATION
    - RAIN
    - FROST
    - CARBON DEOXIDE
  - EROSION
    - WINDS
    - RIVERS
    - OCEANS
    - GLACERIES
    - LIFE
      - PLANTS
      - ANIMALS
      - MAN
- 2. VULCANISM
- 3. DIASTROPHISM
  - VOLCANOES
  - EARTHQUAKES

LENGTH OF MISSISSIPPI RIVER 4000 MILES
" " MISSOURI " 2800 "

IT IS DIVIDED INTO THRE DIVISIONS

1. MISSOURI EXTENDING FROM ITS SOURCE TO ITS JUNCTION WITH THE UPPER MISSISSIPPI NEAR ST LOUIS 2800 MILES

2. THE MIDDLE MISSISSIPPI EXTENDS FROM THE MOUTH OF THE MISSOURI TO THE OHIO 200 MILES

3. THE LOWER MISSISSIPPI EXTENDS FROM THE MOUTH OF THE OHIO AT CAIRO TO THE GULF 1075 MILES

FROM THE SOURCE TO THE GREAT FALLS THE MISSOURI HAS AN AVERAGE FALL OF TEN FEET PER MILE FROM THE FALLS TO THE MOUTH OF THE YELLOW STONE TWO FEET FOUR INCHES

2/5 OF THE AREA DRAINED BY THE MISSISSIPPI. 23 STATES ARE NOT TOUCHED

LENGTH OF COLORADO RIVER 1800 MILES

ITS PRINCIPAL TRIBU-TARIES — THE GRAND, SAN JUAN, LITTLE COLORADO AND GILA ARE ALL ON ITS EASTERN SIDE, ITS BASIN IS WIDEST NEAR THE MOUTH OF THE RIVER

<u>EVIDENCES</u> OF <u>UPHEAVAL OF THE LAND.</u>

1. (A) DOUBLE CANYON (B) UPPER CUTTING MUST BE DONE FIRST
(C) PRESENCE OF MARBLE
2. CROOKED COURSE OF CANYON SHOWS WORK OF WATER NOT FAULT
3. ROCK LAYERS ARE THE SAME
4. SIZE OF CANYON ADJUSTED TO STREAM
5. RIVER IS NOW CUTTING CANYONS

LENGTH OF ST LAWRENCE RIVER 2100 MILES

HERE FALLS UPON THE UNITED STATES ANNUALLY

5.0.00.0.00.0.00.0 00 cuft of water AV

0 000 000 000 000 " " " EVAPARATES CALLED FLY OFF

3 000 000 000 000 " " " RUNS OFF BY STREAMS " RUN "

5 000 000 000 000 " " " SOAKS IN THE GROUND " CUT "

ERAG WATER FALL is 35 TO 40 INCHES

ROSITY OF ROCK
OVERING
ECLEVITY
MOUNT OF RAIN
LIMATE
HARACTER OF RAIN FALL
OSITION OF ROCK

WILL EFFECT THE AMOUNT OF WATER SOAKING IN TO THE GROUND

PORIOUS ROCKS LET WATER PASS THROUGH EASILY

IMPERIOUS ROCKS DOSE NOT

ERE IS ENOUGH WATER IN THE LAND TO COVER ALL THE LAND

00 FEET DEEP 1/2 QUADRILLION CUFT OR 1100 0 CUMILE

OF THE METERAL CARRIED IN SOLUTION IS EQUAL TO THE LOAD

RRIED IN SUSPENSION

FOOT IN 35 YEARS THE MISSISSIPPI RIVER WOULD HAVE DUG THE

PANAMA CANAL IN 79 DAYS

5% OF THE SEA IS SALT
RESENCE OF MICROSOPIC

1/2 TOOT IN 1300 0 YEARS

GLACIAL CONDITIONS.

NECESSARY CONDITIONS FOR FORMING A GLACIER

1. HEAVY SNOW FALL, THAT IS, A GREATER FALL IN THE WINTER THAN WILL MELT IN THE SUMMER.

2. A COOL CLIMATE WITH CHANCES OF TEMPATURE. IN THE HIMALAYA MOUNTAINS, THE GLACIERS ON THE SOUTH SIDE. WHERE IT IS WARM, DESCENDS SEVERAL THOUSAND FEET NEARER SEA LEVEL THAN THOSE ON THE NORTH SIDE BECAUSE OF SNOW PRECIPITATED ON THE SOUTH SLOAP. CHANGES OF TEMPATURE ARE NEEDED BOTH TO CAUSE PRECIPITATION OF MOISTURE AND TO CHANGE IT TO ICE AFTER IT HAS FALLEN.

THERE ARE 5 DIFERENT KINDS OF GLACERIES

1. CLIFF 2. PEADMONT 3 VALLEY 4 CONTINENTAL 5 INSULA

GROUND MORAIN IS FOUND AT THE BOTTOM OF A GLACIERS
MARGINAL " " " " " EDGE " " "
MEDIAL " " " BETWEEN " "
TERMINAL " " " FINAL DEPOSIT " " "
ENGLACIAL " " " INSIDE OF " "

ICE WEICHS OVER 50 LBS PER CU FT A CLACIER 5000 FEET THICK WOULD PRESS DOWN WITH A FORCE OF MORE THAN 250 000 POUNDS ON EVERY SQ FT. BUT IN MANY PLACES THE ICE WAS 10 000 FEET OR MORE IN THICKNESS.

THE HUMBOLDT CLACIER THE LARGEST IN GREELAND MOVES 2 TO 9 FEET PER YEAR ADVANCES INTO THE SEA WITH A WALL 60 MILES LONG 200 TO 300 FEET ABOVE THE WATER. MOULINE A WELL WHICH THE SUBGLACIAL STREAMS REACHES THE BOTTOM

KETTLE HOLES

FORM ONE OF THE MOST CHARACTERISTIC FEATURES OF TERMINAL MORAINES. THEY ARE BOWL-SHAPED OR FUNNEL-SHAPED BASINS OF ALL SIZES AND DEPTHS, HAVING NO OUTLET, AND OFTEN OCCUPIED BY SMALL LAKES. EACH MARKS THE PLACE WHERE A LARGE BLOCK OF ICE DETACHED FROM THE MAIN MASS AND PARTLY BURIED IN DRIFT HAS MELTED AND LEFT A DEPRESSION, AS ICE MELTING UNDER SAWDUST OFTEN DOES.

KAMES

ARE HEAPS OF SAND AND GRAVEL WHICH HAVE BEEN DEPOSITED ALONG OR NEAR THE EDGE OF THE ICE BY OUTFLOWING STREAMS OF WATER. THEY TAKE THE FORM OF MOUNDS AND WINDING RIDGES WITH A HUMMOCKY AND RAPIDLY UNDULATING OUTLINE. THE MATERIAL IS MORE OR LESS PERFECTLY STRATIFIED. THEY OCCUR IN CONNECTION WITH MORAINES AND ARE OFTEN DIFFICULT TO DISTINGUISH FROM THEM.

ESKERS

ARE LONG, WINDING RIDGES OF GRAVEL WHICH EXTEND OFTEN FOR MANY MILES ACROSS HILLS AND VALLEYS IN THE DIRECTION OF ICE MOVEMENTS THEY ARE ACCUMULATIONS FORMED IN THE TUNNELS OF SUBGLACIAL STREAMS OR IN ICE-WALLED CANYONS OPEN TO THE SKY.

DRUMLINS

ARE PECULIAR ROUNDED AND ELONGATED LENTICULAR HILLS OF BOULDER CLAY, WHICH WERE FORMED UNDER THE ICE SOME DISTANCE BACK FROM THE MARGIN, AND PERHAPS CORRESPOND TO THE SAND BARS IN RIVERS,

THERE MUST HAVE BEEN 10000 YEARS SINCE THE GLACIER COVERED NORTH AMERICA

EXPLANATORY NOTES.

Observations taken at 8 a. m., seventy-fifth meridian time. Air pressure reduced to sea level.

ISOBARS, or continuous lines, pass through points of equal air pressure.

ISOTHERMS, or dotted lines, pass through points of equal temperature.

SYMBOLS indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; ARROWS fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T," in table, indicates amount too small to measure.

LAKES

A LAKE IS A REACH. SO SAIS PROFESSOR GREEN.

A " " " BODY OF COMPARATIVELY STILL WATER NEARLY SURROUNDED BY LAND SAIS PROFESSOR HOPKINS.

FORMATION OF LAKES.

1 ANY DEPRESSION BASIN-LIKE WHICH EXTENDS BELOW THE WATER TABLE.

2 BY RIVERS ON THE FLOOD-PLAIN (A) BY CUTTING OF MEANDERS THE OX-BOW LAKES (B) BY BUILDING UP A NATURAL LEVEE ACROSS THE MOUTH OF A TRIBUTARY (C) BY TRIBUTARY BUILDING AN ALLUVIAL FAN ACROSS THE MAIN STREAM

3 A RIVER MAY BUILD A DELTA ACROSS A GULF OR BAY

4 MAY BE FOUND BY WARPING OR TWISTING OF THE EARTH CRUST.

5 FOUND BY GLACIERS (A) MORAINS FORM DAMS ACROSS VALLEYS (B) THE ICE ERODES DEPRESSIONS IN THE ROCK WHICH FILL WITH WATER. (C) IN A HEAVY MORAIN DEPOSIT THERE WILL BE MANY KETTLE-LIKE DEPRESSIONS, (D) WHERE THE WATER FROM THE MELTING GLACIER FLOWS OVER THE EDGE OF A CLIFF.

6 VOLCANOES MAY FORM LAKES BY STREAMS OF LAVA FLOWING ACROSS A VALLEY AND FORMING A ROCK DAM.

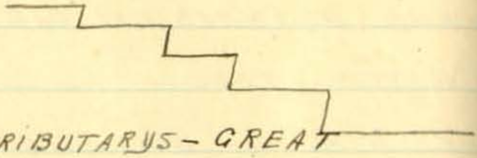
7 EARTHQUAKES SOMETIMES CAUSE THE FORMATION OF LAKES

8 LANDSLIDES SOMETIMES FORM DAMS ACROSS VALLEYS

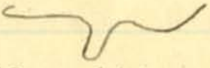
9 BY BEAVERS BUILDING DAMS ACROSS STREAMS.

STREAMS

YOUNG STREAM - V SHAPE VALLEY - FEWTRIBUTARYS - SMALL VOLUM OF WATER - VOLOCITY GREAT - LAKES - MANY FALLS - LOAD SMALL - COURSE MATERIAL - DIVIDE ILL DEFINED - TABLE LAND - DOING CORRASION WORK - IRREG PROFILE



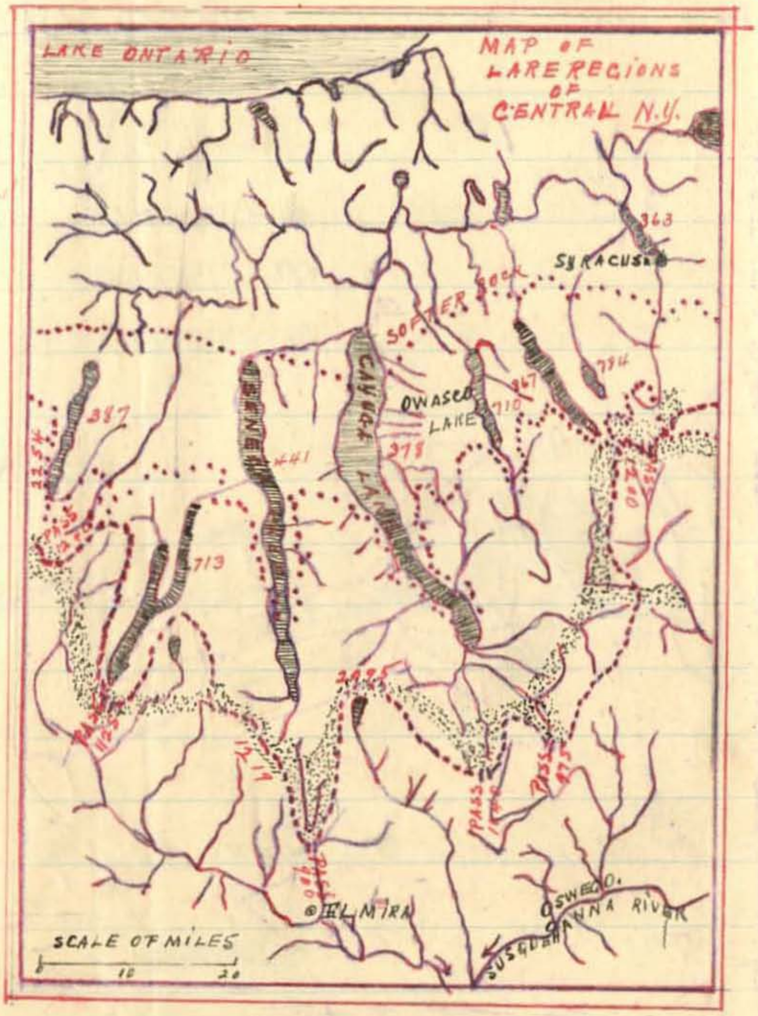
MATURITY - U SHAPE VALLEY - MANY TRIBUTARYS - GREAT VOLUM OF WATER NO LAKES - NO FALLS WELL DEFINED /\ — Ideal CURVE

OLD AGE WIDE VALLEYS  MANY TRIB - GREAT VOLOSITY - VOL SLOW LAKES ALLUVIAL - NO FALLS — GREAT LOAD — SMALL AND DEFINED DIVIDE MUCH LOWER PROFILE - MEANDERS - IDEAL CURVE 

MALASPINA GLACIER

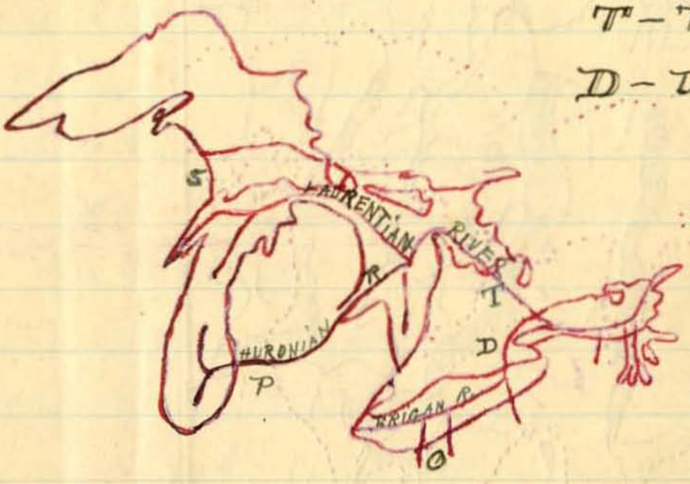
THE MALASPINA GLACIER GLACIER OF ALASKA, THE TYPICAL GLACIER OF THIS KIND IS SEVENTY MILES WIDE AND STRETCHES FROM THIRTY MILES FROM THE FOOT OF MOUNT SAINT ELIAS RANGE TO THE SHORE OF THE PACIFIC OCEAN. THE YAHTSE RIVER ISSUES FROM A HIGH ARCHWAY IN THE ICE A MUDDY TORRENT ONE HUNDRED FEET WIDE AND 20 FEET DEEP LOADED WITH SAND, AND STONES.

FINGER LAKES DRAWING FROM DRYER FIG 104



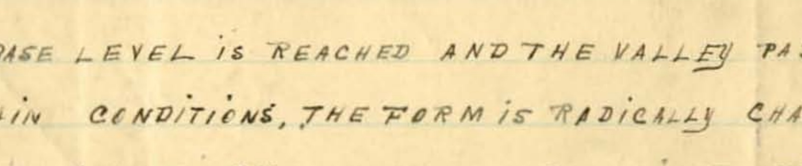
MAP OF THE PREGLACIAL LAURENTAIN RIVER

S - SUPERIOR VALLEY
P - PEWAMO "
O - CUYAHOGA "
T - TORONTO "
D - DUNDAS "

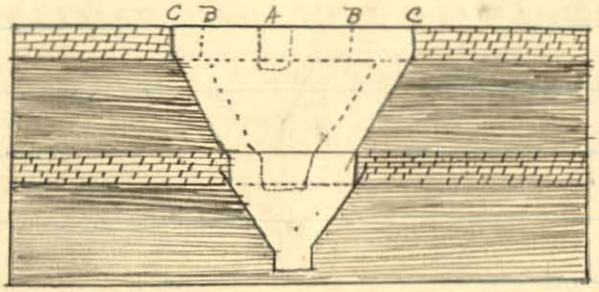


DEVELOPMENT OF VALLEYS - BY DOWNWARD CORRASION

FIG. 116.

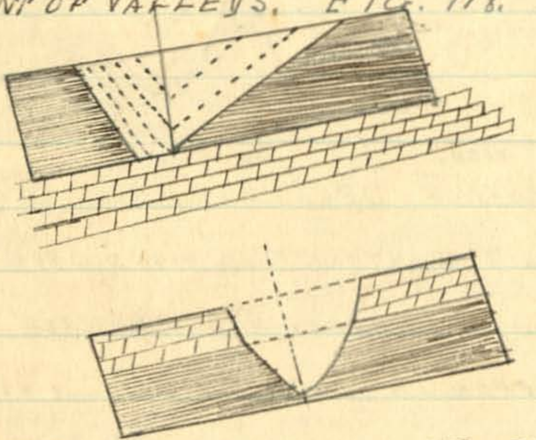


WHEN THE BASE LEVEL IS REACHED AND THE VALLEY PASSES INTO A FLOOD-PLAIN CONDITIONS, THE FORM IS RADICALLY CHANCED, AS IN D. IF THE WALLS OF THE VALLEY CONTAINES STRATA OF UNEQUAL HARDNESS, THE FORM IS ~~NOT HORIZONTAL, VARIOUS UNS~~ MODIFIED BY THE PROJECTION OF HARD LAYERS ANI THE RETREAT OF SOFTER ONES, DEVELOPMENT OF VALLEYS - By DOWNMARD CORRASION FIG. 117.



IF THE STRATA ARE NOT HORIZONTAL, VERIOUS UNSYMMETRICAL FORMS ARE PRODUCED AS FIG. 118

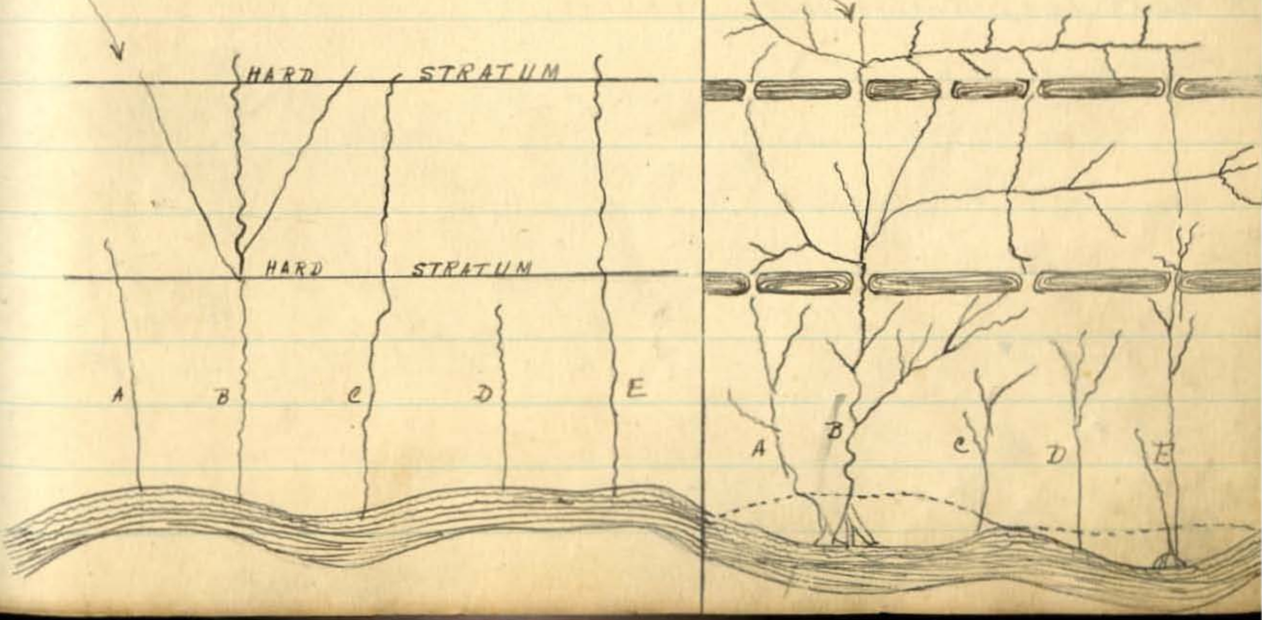
DEVEROPMENT OF VALLEYS. FIG. 118.



A CONSEQUENT DRANAGE

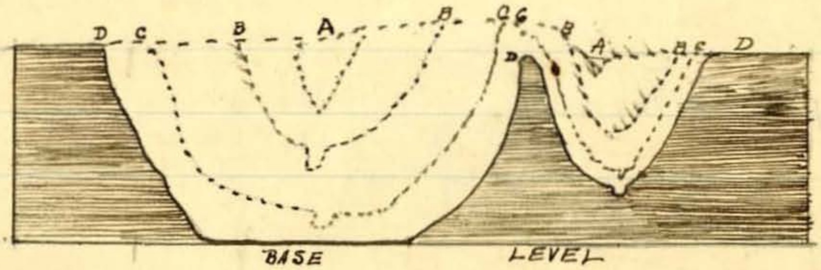
B SUBSEQUENT DRANAGE. WITH DRYER WATER AND WIND GAPS.

Fig 125.



(FIG 125·a) FLOW DOWN A MODERATE SLOPE ACROSS WHICH TWO STRATA OF HARD ROCK EXTEND AT RICHT ANCLES TO THE STREAMS. THE STRONCEST STREAM (B) IS ABLE TO CUT GAPS THROUGH THE HARD STRATA MORE RAPIDLY THAN THE WEAKER ONES

FIG 119



DRAWING REPRESENTING DEVELOPEMENT OF DIVIDES

AS THE VALLEYS WIDEN, THE INTERSTREAM RIGES GROW NARROWER AND SHARPER AND ARE FINALLY LOWERED. A SLOPE MADE IRREGULAR BY WEATHERING IS STEEPER IN HARD MATERIAL AND MORE GENTLE IN SOFT, AND THE TENDENCY OF WATER RUNNING OVER IT IS TO WEAR AWAY THE PROJECTED CORNERS,

FIG 110 DRYER. ICE-DAMMED LAKES

WHEN THE ICE SHEET BEGAN TO MELT AWAY, AND THE SOUTHERN DIVIDE OF THE LAURENTAIN BASIN WAS UNCOVERED, THE WATER COLLECTED AT SEVERAL POINTS ALONG THE ICE FRONT AND FORMED A NUM OF TEMPORARY LAKES OF VARIED AND CHANGING SIZE AND FORM. THEY WERE BOUNDED AND HELD IN THE NORTH BY THE WALL OF THE RETREATING ICE FRONT, BUT THEIR OUTLINES AND OUTLETS CAN STILL BE TRACED BY THE FORMED WHERE THE WAVES BEAT AGAINST THE LAND

FIG 110 DRYER

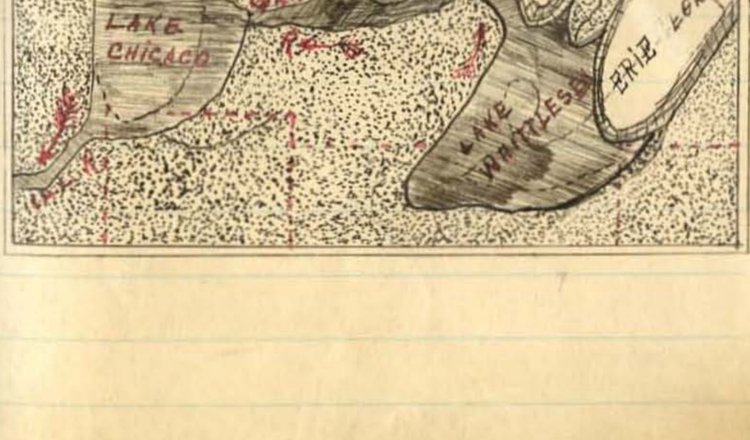


FIG 110 SHOWS THREE OUT OF THE MANY SUCCESSIVE STAGES IN THE LONG AND COMPLICATED HISTORY OF THE LAURENTIAN LAKES.

FIG 110 DRYER ICE-DAMMED LAKES.

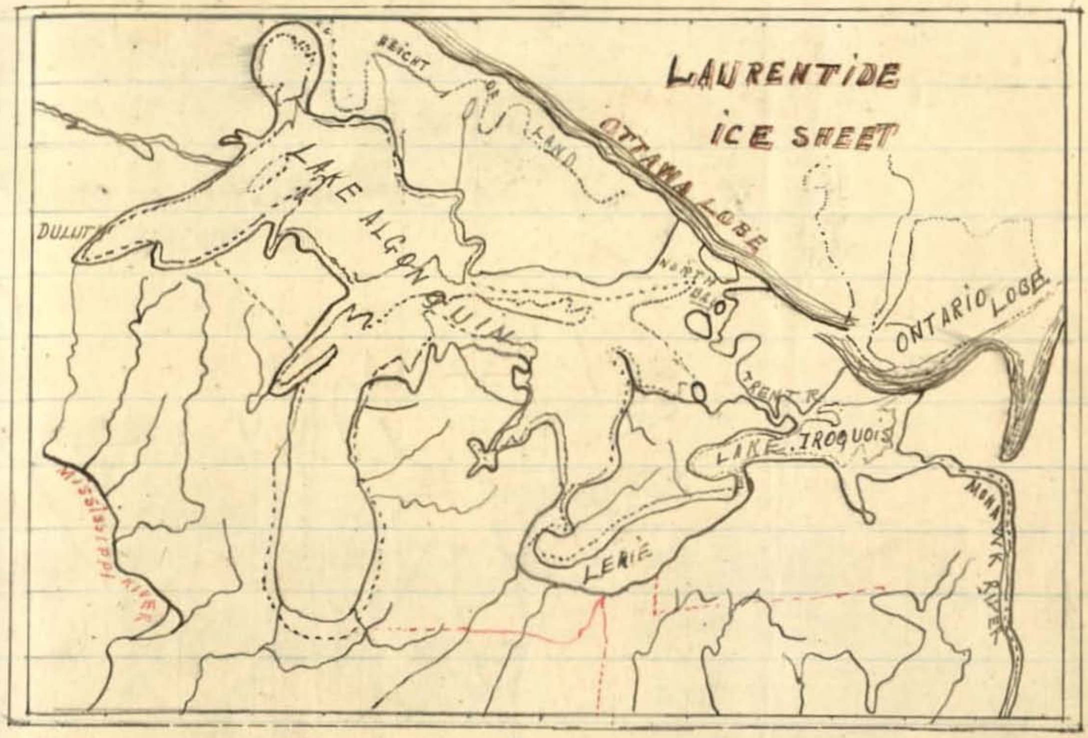
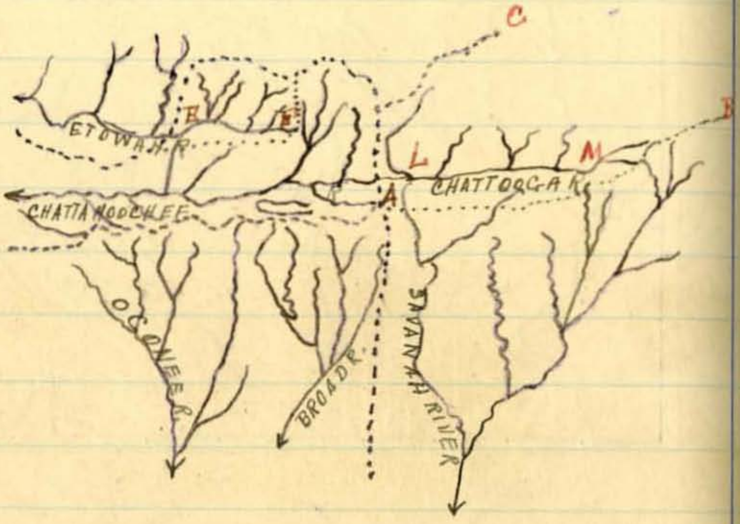
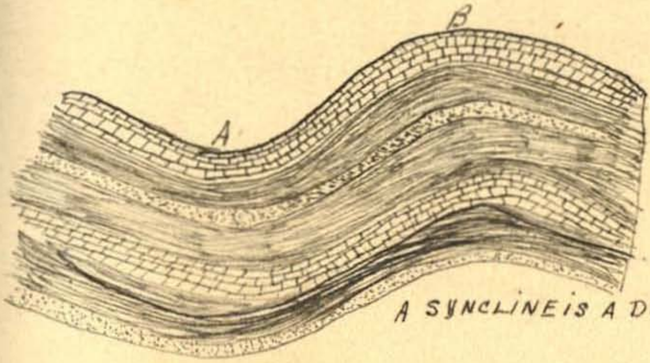


FIG. 123 **DRYER** MIGRATION OF DIVIDES



THE CHATTOOGA RIVER, AT THE WESTERN CORNE OF SOUTH CAROLNA, WAS FORMERLY THE UPPER PART OF THE CHATTAHOOCHEE; BUT THE SAVANNAH HAD A SHORTER COURSE TO THE SEA AND A MORE RAPID FALL. ONE OF ITS TRIBUTARIES WAS ABLE TO EXTEND ITSELF UNTIL IT TAPPED THE CHATTAHOOCHEE AND ROBBED IT OF ITS HEAD WATERS (LM) THE DIVIDE WAS SHIFTED FROM THE LINE (AB) TO THE LINE (AC) THE OCONEE WILL PROBABLY REPEAT THIS PROCESS IN THE NEAR FUTURE.

A FAULT IS A FRACTURE ACCOMPANIED BY DISPLACEMENT OF THE STRATA. IT MAY BE ACCOMPANIED BY BENDING UP OR DOWN OF STRATA. THE AMOUNT OF THROW OR VERT. CAL DISPLACEMENT IS SOMETIMES AS MUCH AS 20,000 FEET.



A SYNCLINE IS A DOWNFOLDING OF A TROUGH, AS AT A,

FIG. 143. DRYER

AN ANTICLINE IS AN UPFOLDING OF THE STRATA IN THE FORM OF AN ARCH, AS AT B. FIG. 143.

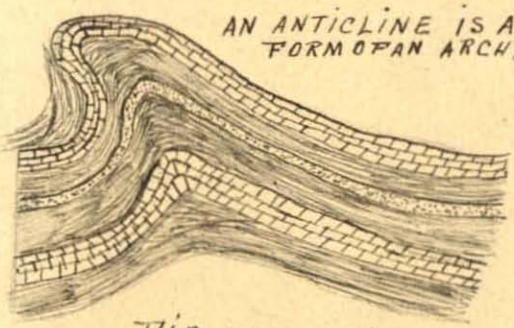


FIG. 144. DRYER

AN ANTICLINE IS SOMETIMES OVER-THRUST, AS IN FIG 144 AND 145.

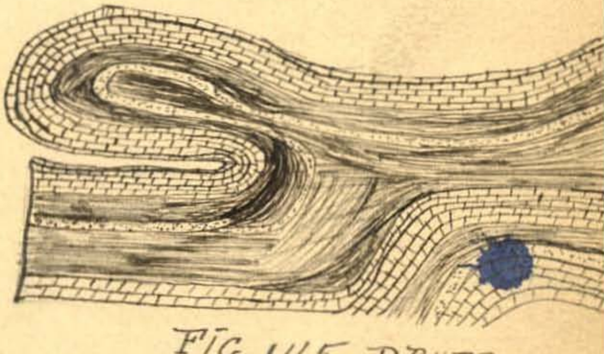


FIG. 145. DRYER

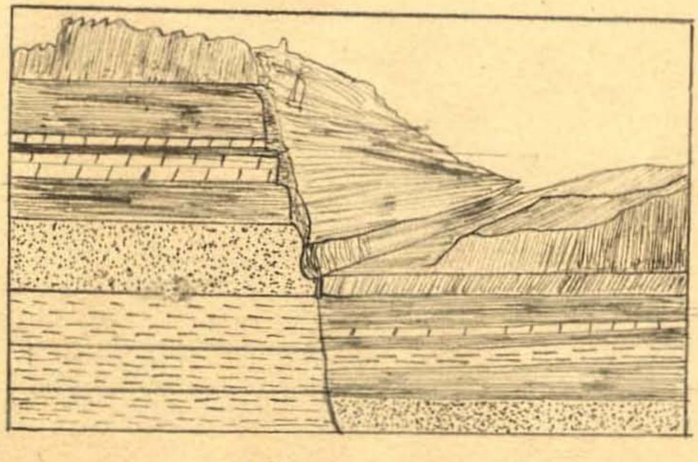
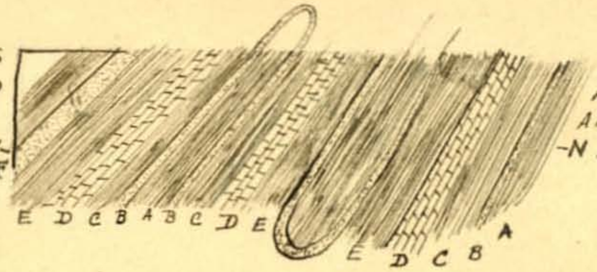
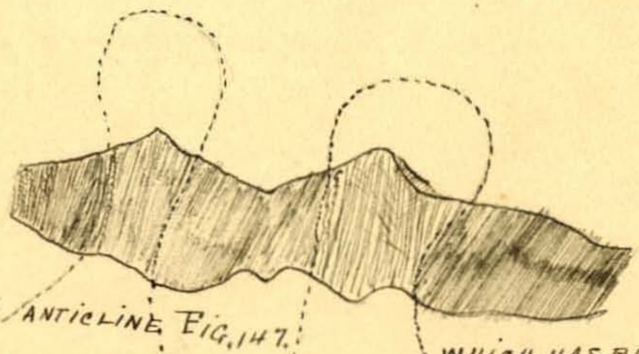


FIG. 142. A FAULT DRYER

FIG. 146 DRYER



COMPRESSED FOLDS ARE A SERIES OF SHARPLY BENT SYNCLINES AND ANTICLINES IN WHICTHE CONNECTING LIMBS ARE PARALLEL AND NEARLY VERTICAL, AS SHOWN IN FIG. 146.



A FAN FOLD IS AN ANTICLINE WHICH HAS BEEN PINCED AT THE BOTTOM UNTIL IT IS NARROWER THERE THAN AT THE TOP, AS SHOWN IN FIG. 147.

FIG. 147.

IN NATURE THESE FORMS ARE SELDOM FOUND COMPLETE, BUT MORE OR LESS EXTENSIVELY

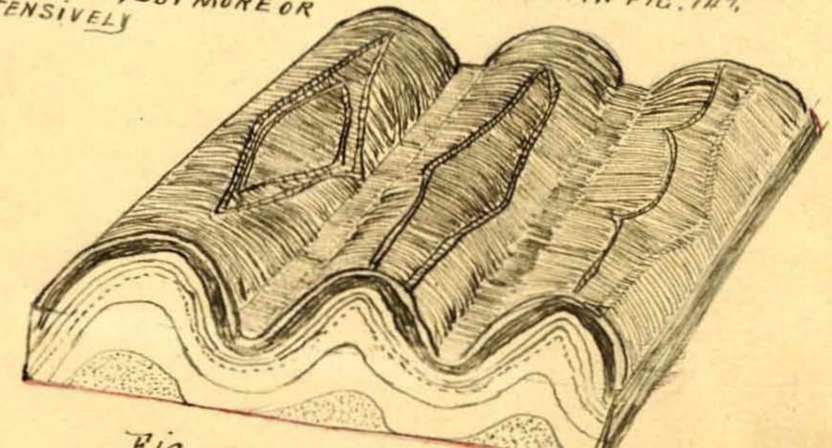


FIG. 154. STEROGRAM OF JURA MOUNTAINS

IN THE BACKGROUND THE UINTA FOLD IS SUPPOSED TO HAVE REMAINED UNERODED, WHILE THE FOREGROUND SHOWS THE UINTA MOUNTAINS AS THEY EXIST.

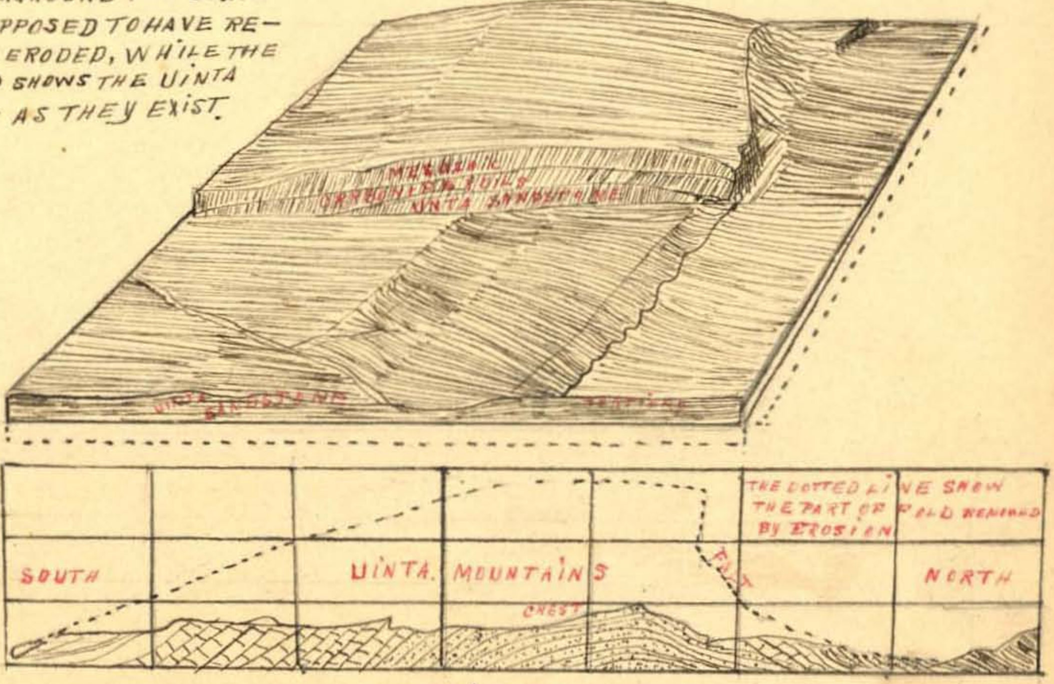


FIG. 153. DRYER

FIG. 153. SHOWS IN THE FOREGROUND THE MOUNTAINS AS THEY ARE, AND IN THE BACKGROUND THE MOUNTAINS AS THEY WOULD BE IF THE ERODED MATERIAL WERE RESTORED.

FIG. 155. — SECTION OF APPALATIAN MOUNTAINS

AT 2 AN ANTICLINE HAS BEEN REDUCED TO A VALLEY, 3 A SYNCLINE IS LEFT STANDING AS A RIDGE MADE UP OF CONCAVE STRATA LIKE A PILE OF PLATTERS. THE RIDGES AT 4 ARE PROJECTIONS OF HARD STRATA ABOVE THE MORE EASLY ERODED ONES ON EITHER SIDES. MOST OF THE PRESENT RIDGES ARE OF THIS CHARACTER

FIG. 157. ERODED SYNCLINE; CANOE VALLEY

THE LEVEL SANDSTONE-TOPPED RIDGES OF UNIFORM HEIGHT AND THE SOFTER STRATA OF SHALE AND LIMESTONE IN THE VALLEYS BETWEEN SUGGEST THE APPALACHIAN

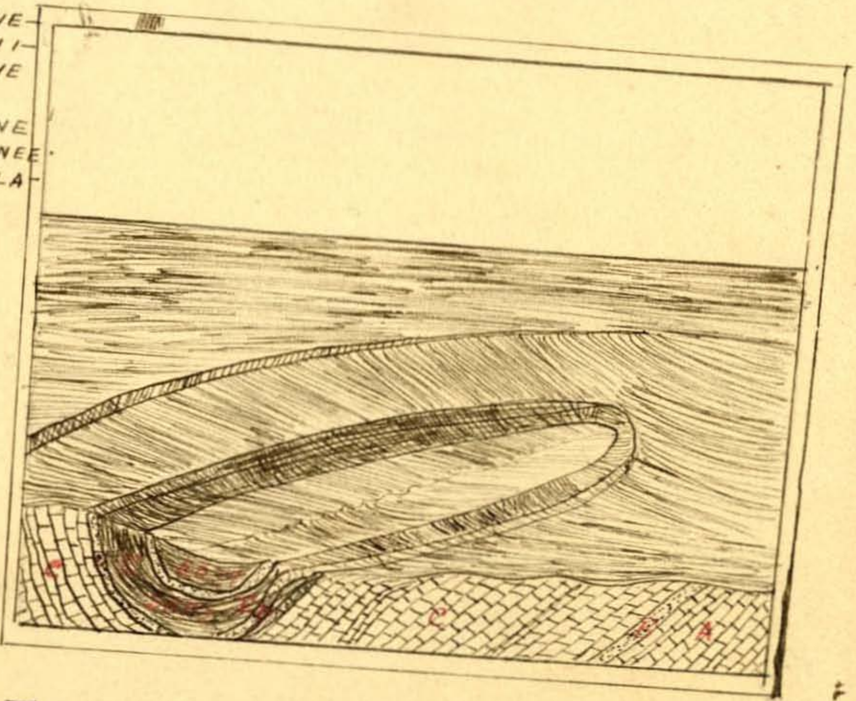
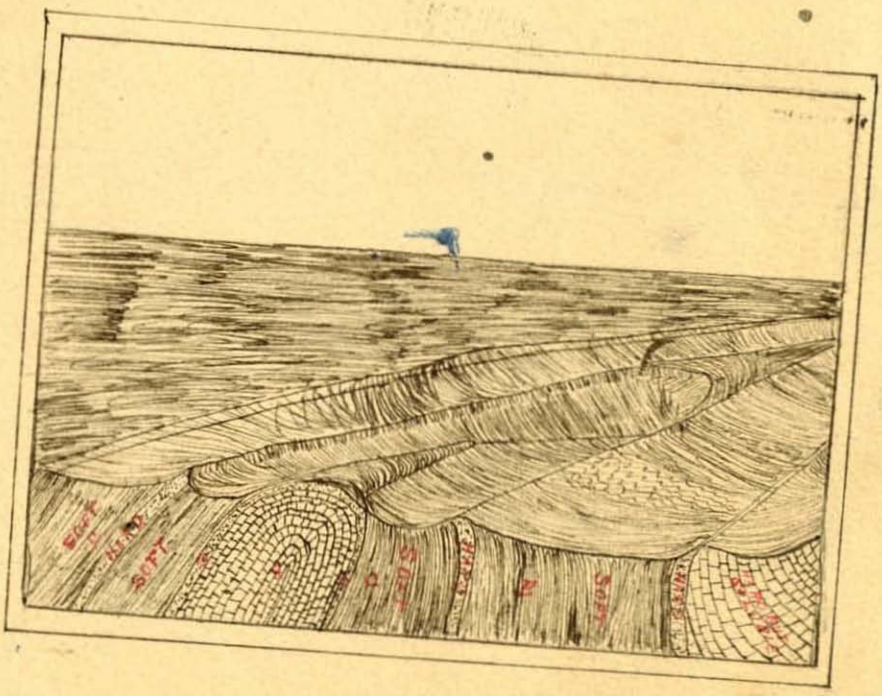


FIG. 158. ERODED ANTICLINE



MOUNTAINS CLASSIFIED { AS DASTROFIC MOUNTAINS

1 BLOCK MOUNTAINS {
- SIERRA AND NEVADA
- GREAT BASIN
- COLORADO PLATEAU

2 SIMPLE ANTICLINE {
- UINTA MOUNTAINS
- HENRY
- BLACK HILLS

3 SERIES OF ANTICLINES {
- JURA MOUNTAINS OF SWITZERLAND
- APPALACHIAN "

4 COMPLEX FOLDED {
- ALPS

5 PLATEAU MOUNTAINS {
- MONOCLINES
- COLORADO

6 RELICT {
- NEW ENGLAND
- SCOTTISH

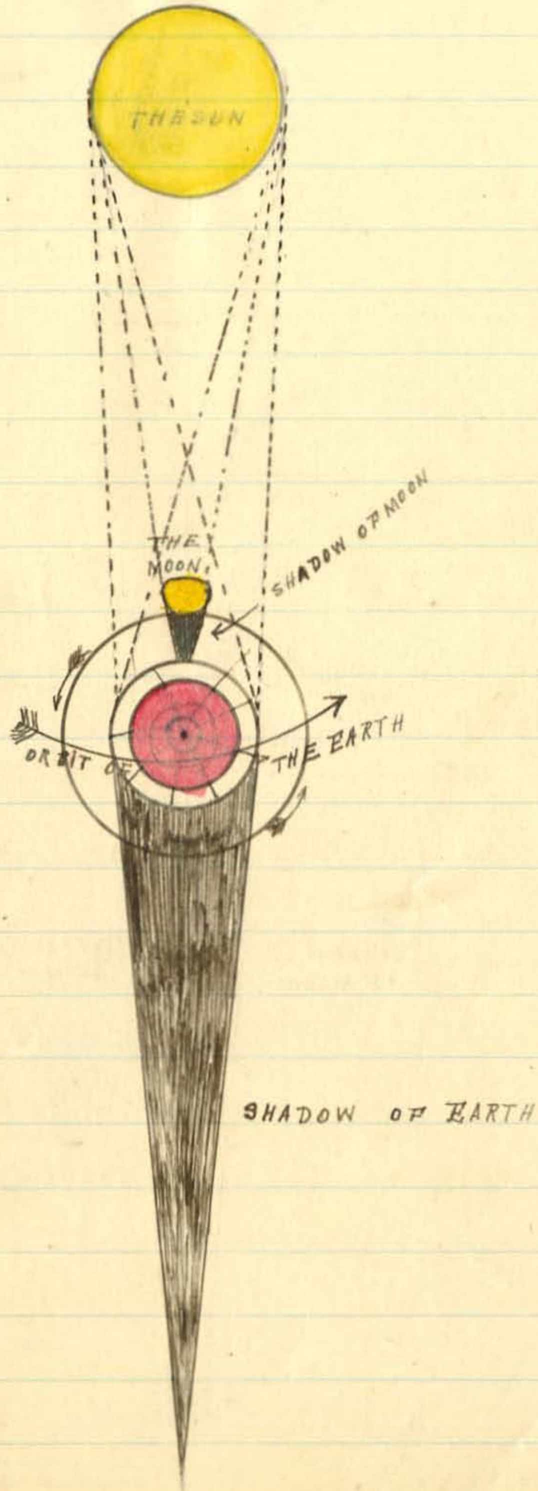
VOLCANOES ARE HOLES IN THE EARTH CRUST WHICH CAUS DISTURBENCE BETWEEN THE INTERIOR AND EXTERIOR. STROMBOLI IS CALLED THE LIGHT HOUSE OF THE MEDITERRANEAN SEA.

WHAT WE SAW ON OUR TRIP TO THE WHITE STONE QUARRY AND LOST RIVER

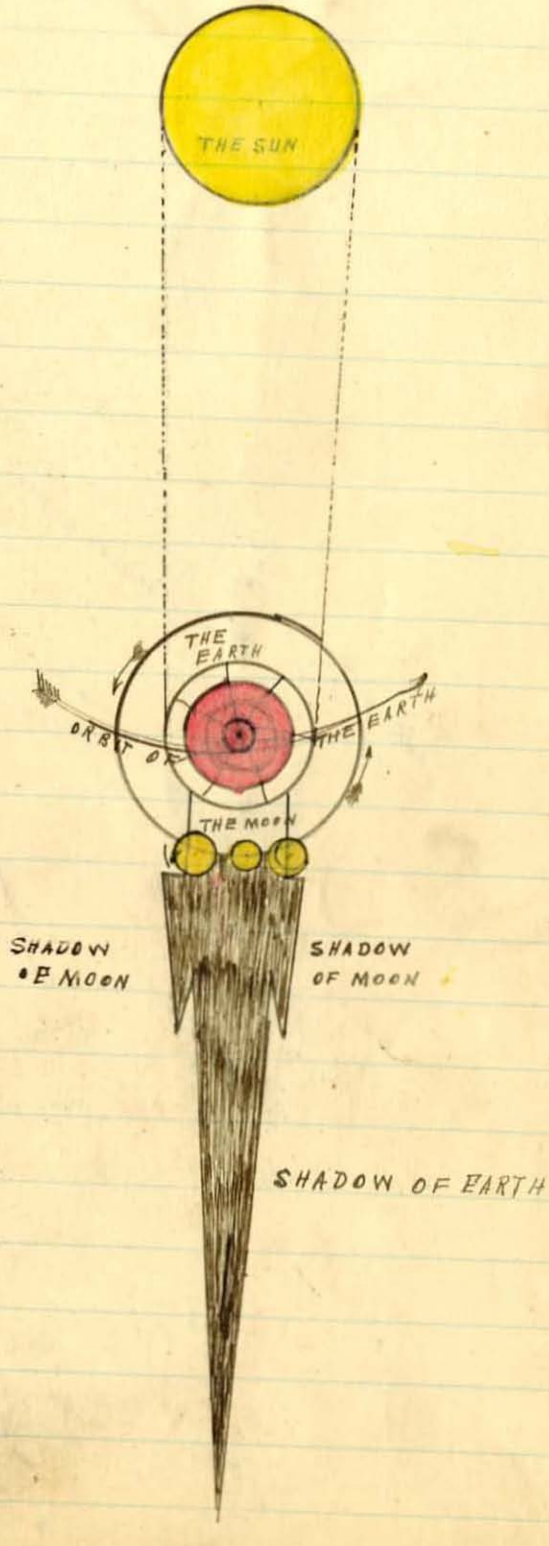
1 MANTLE ROCK
2 BEDROCK
3 SOIL
4 SAND
5 SINK HOLES
6 ALLUVIAL FAN
7 UNDERGROUND WATER
8 LIME STONE
9 FOSSILS
10 OVERLOADED STREAM
11 ALLUVIAL CONE
12 CAVE
13 LAYERS AND LANINCE
4 FALLS
5 WEATHERING OF BED ROCK
6 V-SHAPE VALLEY
7 TALUS SLOPE
STALACTITE AND STALAGTMITE
TURFA
VALLEY MADE OF RUNNINC WATER T YWATER
SLATE
PLAINS OF BEDDING
SPRINGS
SURFACE STREAMS
FLOOD PLAINS

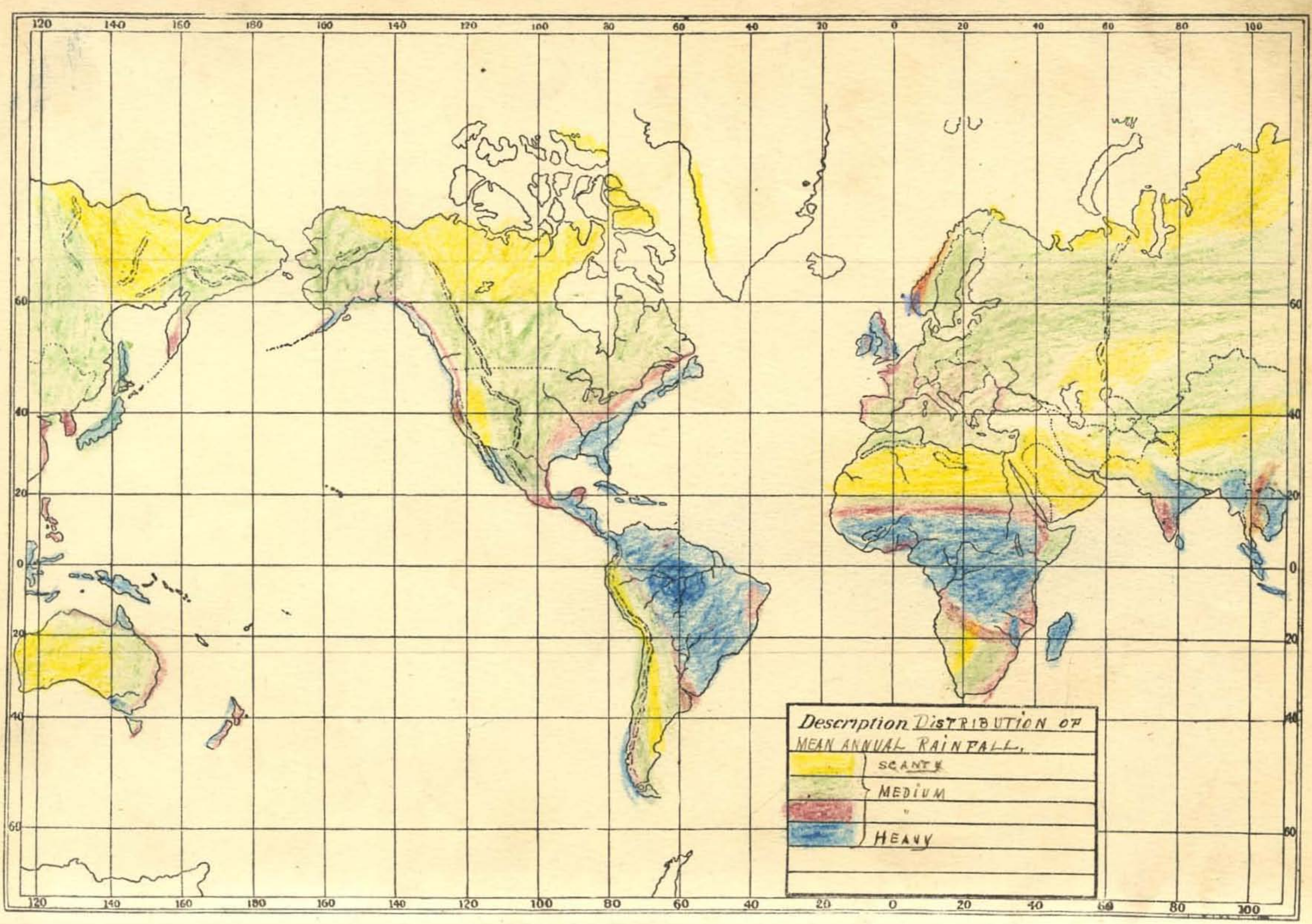
26 JOINTS
27 PEBBLES
28 BOULDERS

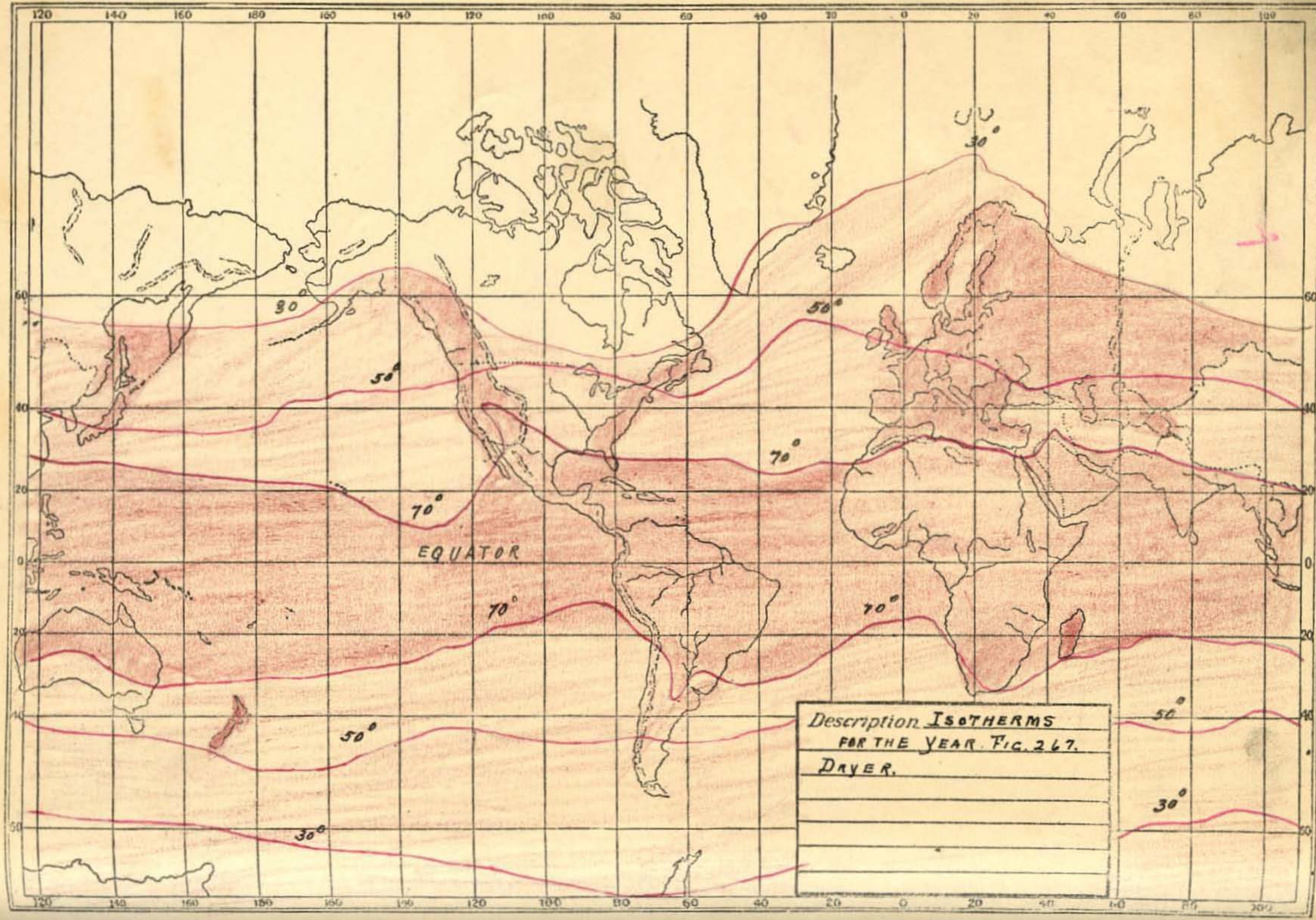
ECLIPSE OF THE SUN



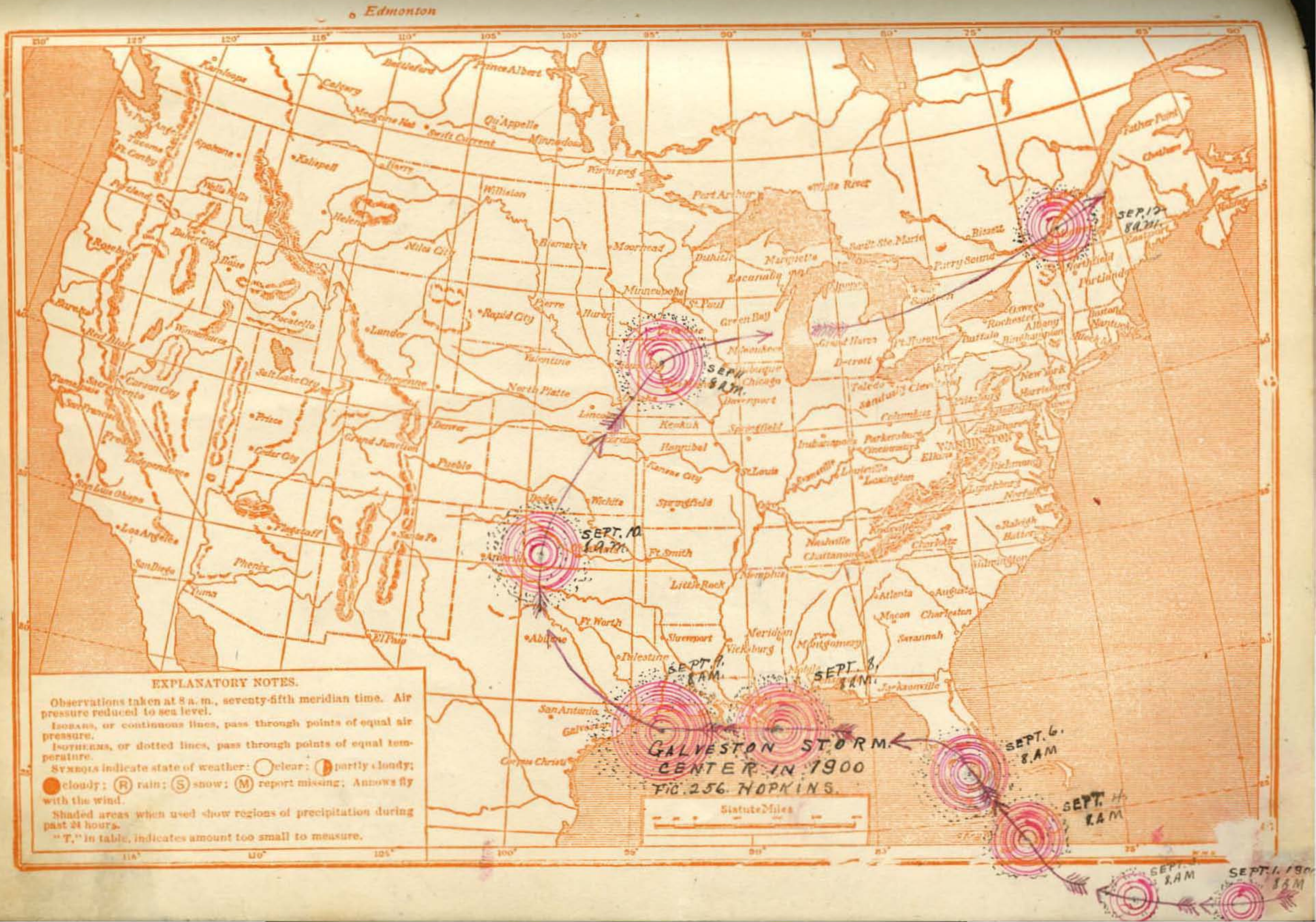
THE ECLIPSE OF THE MOON




Description Distribution of
Mean Annual Rainfall.
Scanty
Medium
"
Heavy
120
140
160
180
160
140
120
100
80
60
40
20
0
20
40
60
80
100
60
40
20
0
20
40
60



Description Isotherms
for the Year. Fig. 267.
Dryer.



EXPLANATORY NOTES.

Observations taken at 8 a. m., seventy-fifth meridian time. Air pressure reduced to sea level.

Isobars, or continuous lines, pass through points of equal air pressure.

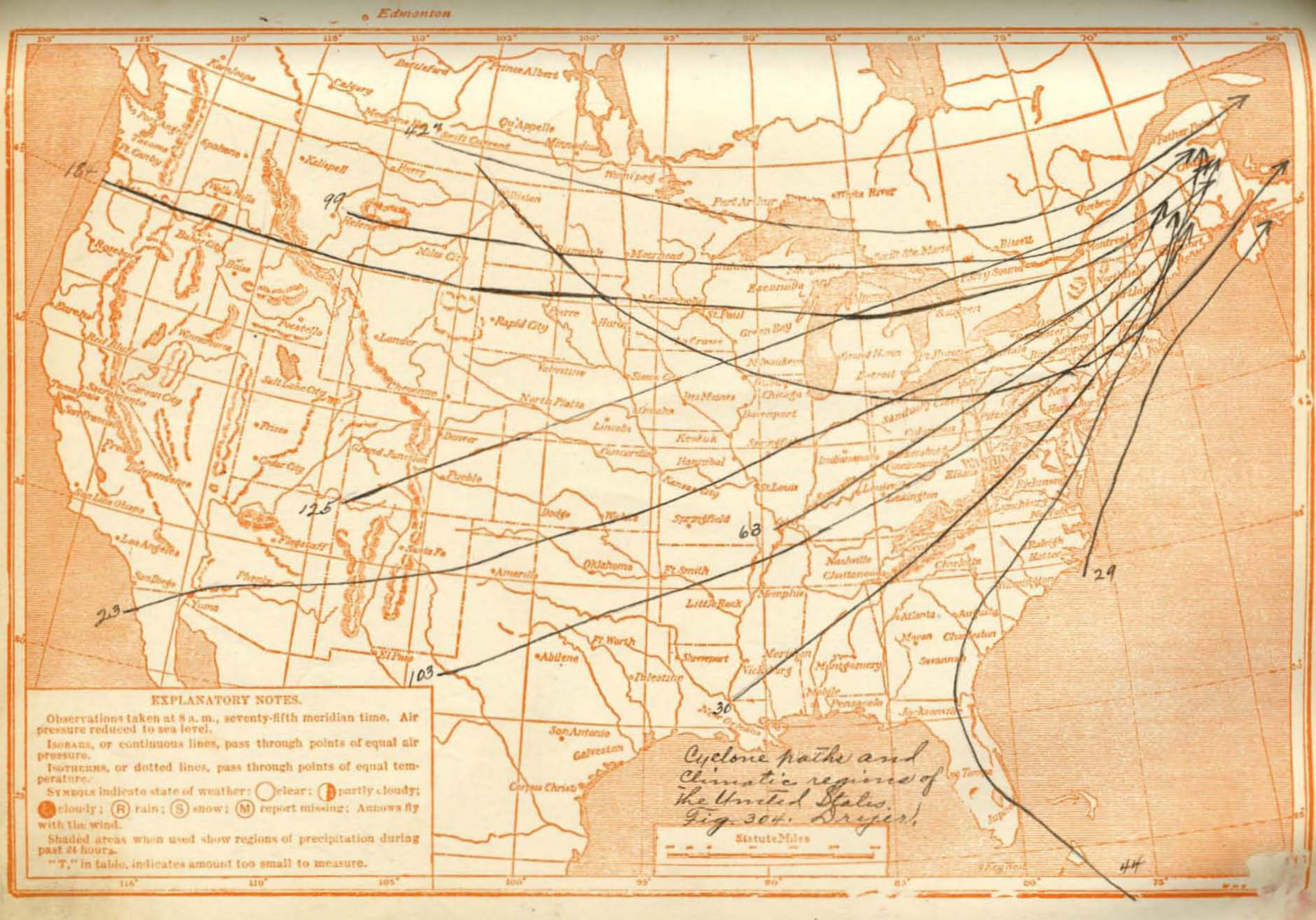
Isotherms, or dotted lines, pass through points of equal temperature.

Symbols indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; Arrows fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T." in table, indicates amount too small to measure.

GALVESTON STORM.
CENTER IN 1900
FIG. 256 HOPKINS.



EXPLANATORY NOTES.

Observations taken at 8 a. m., seventy-fifth meridian time. Air pressure reduced to sea level.

ISOBARS, or continuous lines, pass through points of equal air pressure.

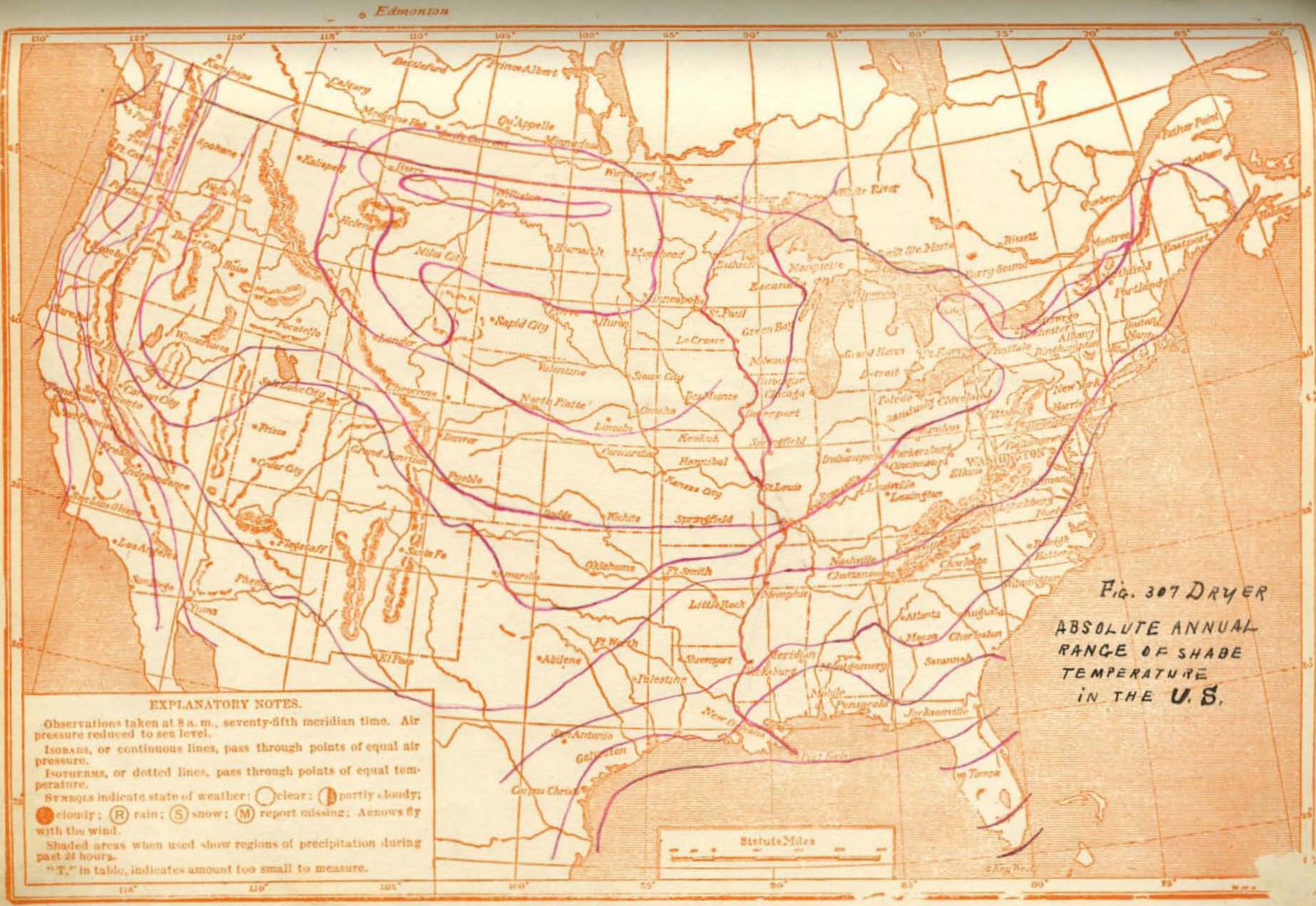
ISOTHERMS, or dotted lines, pass through points of equal temperature.

SYMBOLS indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; Arrows fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T," in table, indicates amount too small to measure.

Cyclone paths and
climatic regions of
the United States.
Fig. 304. Dreyer!



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"T." in table, indicates amount too small to measure.

Fig. 307 Dryer

ABSOLUTE ANNUAL RANGE OF SHADE TEMPERATURE IN THE U.S.

EXPLANATORY NOTES.

Observations taken at 8 a.m., seventy-fifth meridian time. Air pressure reduced to sea level.

ISOBARS, or continuous lines, pass through points of equal air pressure.

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SYMBOLS indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; ARROWS fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T," in table, indicates amount too small to measure.

Fic. 306. DRYER

AVERAGE TEMPERATURE FOR JULY IN THE U.S.

Fig. 305 DRYER.
AVERAGE TEMPERATURE FOR JANUARY IN THE U.S.

EXPLANATORY NOTES.

Observations taken at 8 a. m., seventy-fifth meridian time. Air pressure reduced to sea level.

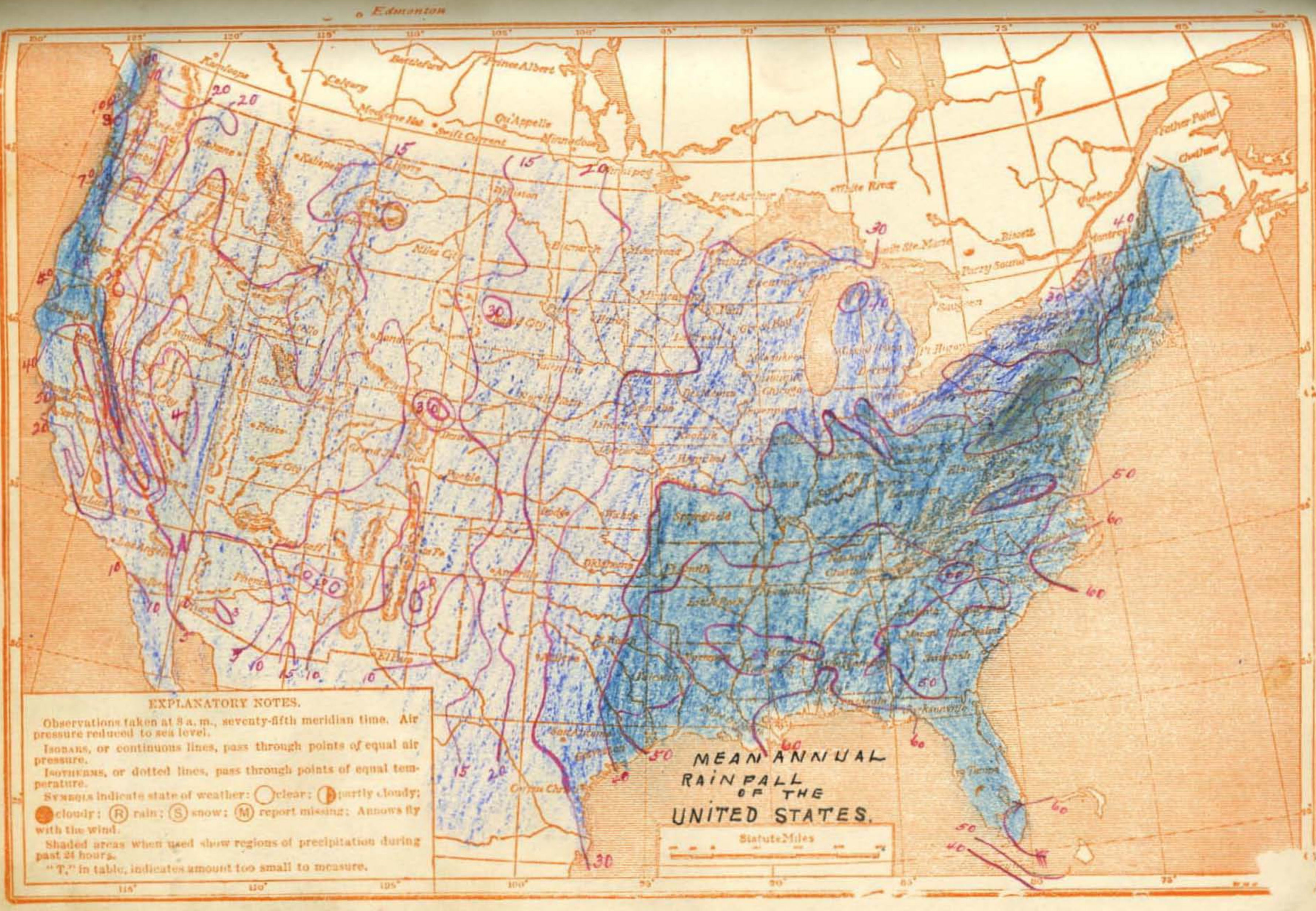
Isobars, or continuous lines, pass through points of equal air pressure.

Isotherms, or dotted lines, pass through points of equal temperature.

Symbols indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; Arrows fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T," in table, indicates amount too small to measure.



MEAN ANNUAL RAINFALL OF THE UNITED STATES.

EXPLANATORY NOTES.

Observations taken at 8 a. m., seventy-fifth meridian time. Air pressure reduced to sea level.

Isobars, or continuous lines, pass through points of equal air pressure.

Isotherms, or dotted lines, pass through points of equal temperature.

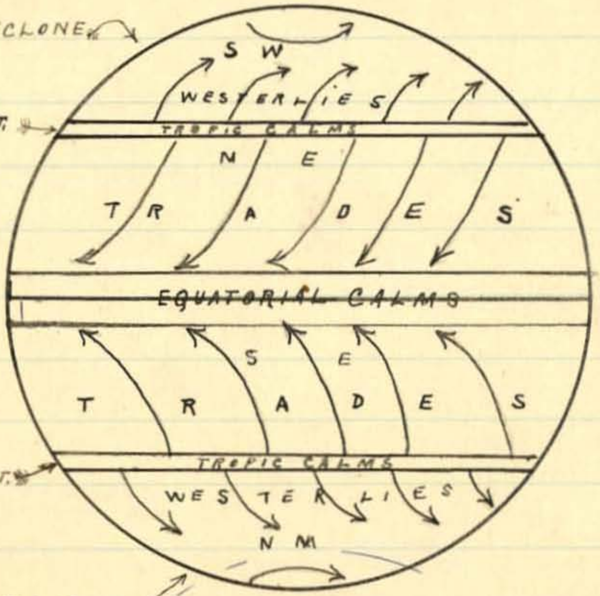
Symbols indicate state of weather: ○ clear; ◐ partly cloudy; ● cloudy; Ⓡ rain; Ⓢ snow; Ⓜ report missing; Arrows fly with the wind.

Shaded areas when used show regions of precipitation during past 24 hours.

"T." in table, indicates amount too small to measure.

LAND OF THE. CYCLONE.

PERM. HIGHS of HORSE LAT.



PER. LOWS OR HORSE LAT.

LAND OF THE CYCLONE.

Fic. 281. Dryer.

DISTRIBUTION OF PRESSURE AND WINDS.

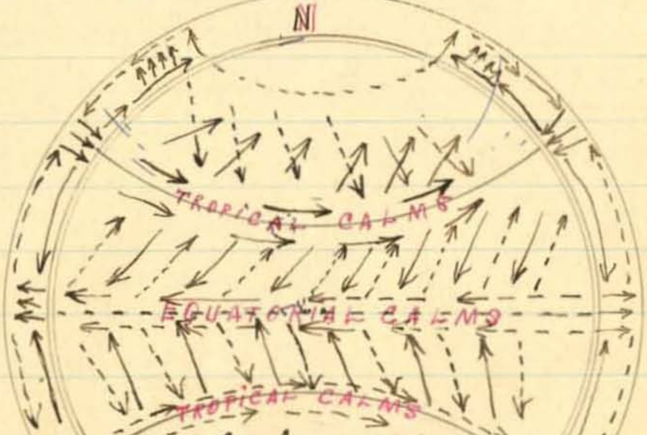


Fig. 282. Dryer.

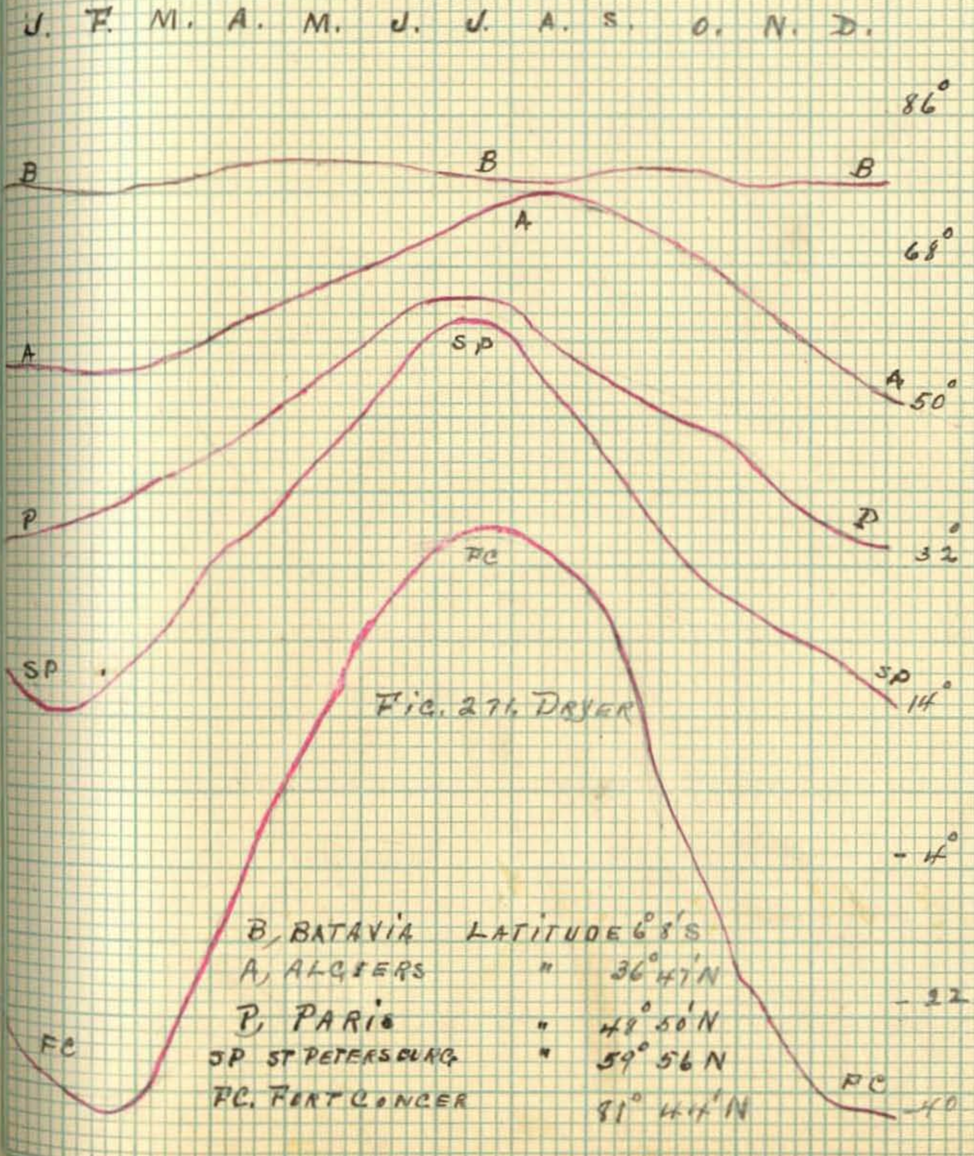


Fig. 271. Dryer

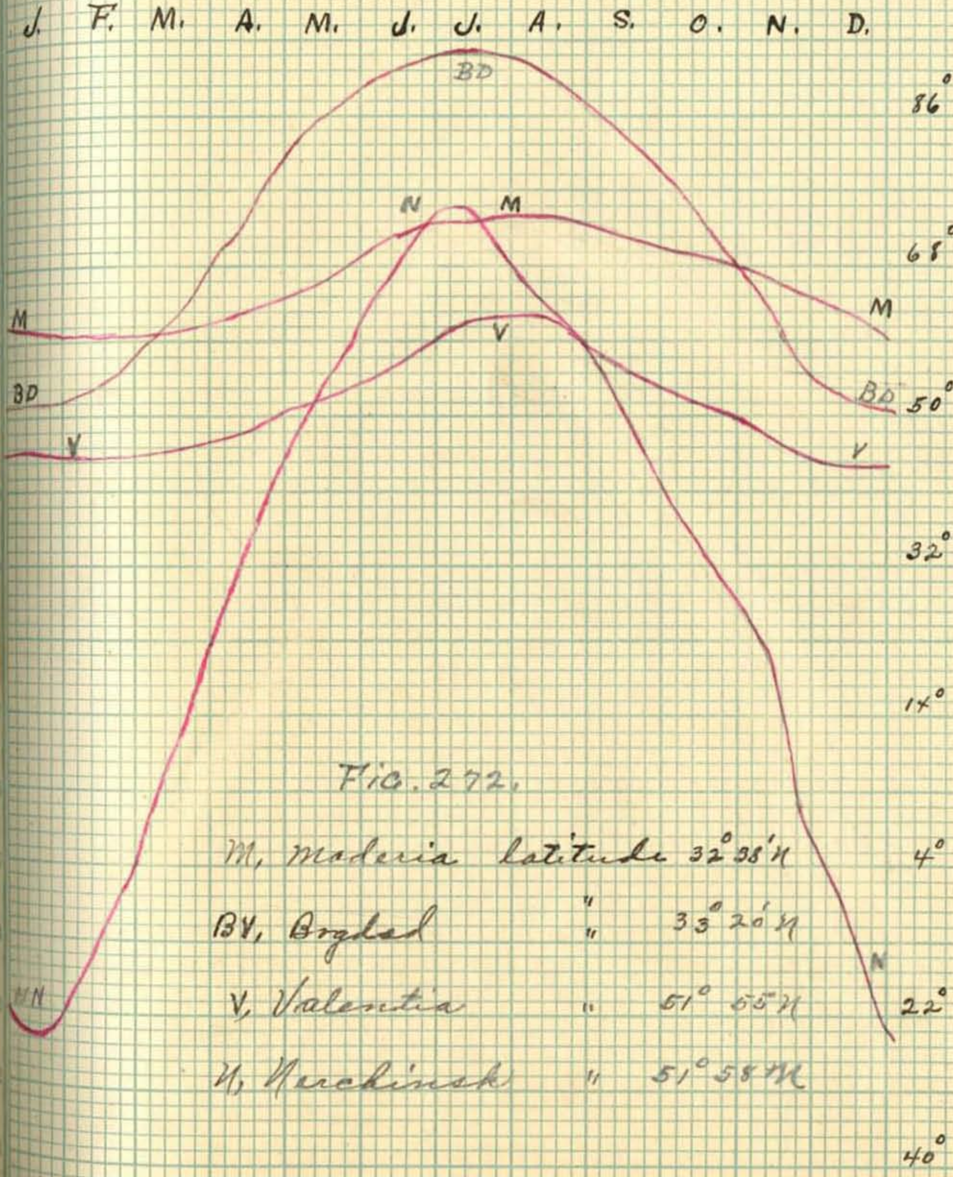


FIG. 272.

M, Maderia latitude 32°38'N
BD, Bagdad " 33°20'N
V, Valentia " 51° 55'N
N, Nerchinsk " 51° 58'N

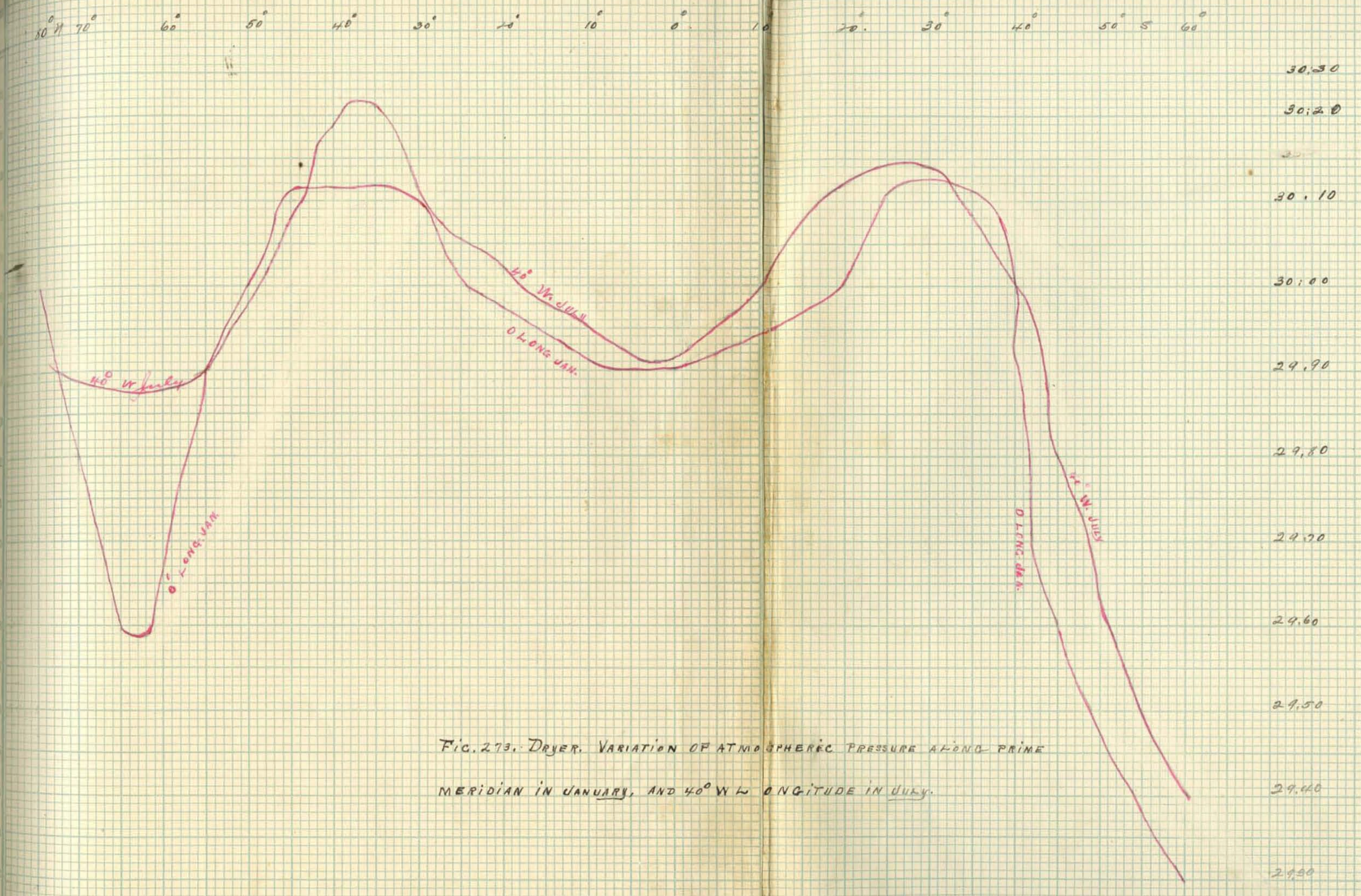


FIG. 273. DRYER. VARIATION OF ATMOSPHERIC PRESSURE ALONG PRIME MERIDIAN IN JANUARY, AND 40° W LONGITUDE IN JULY.

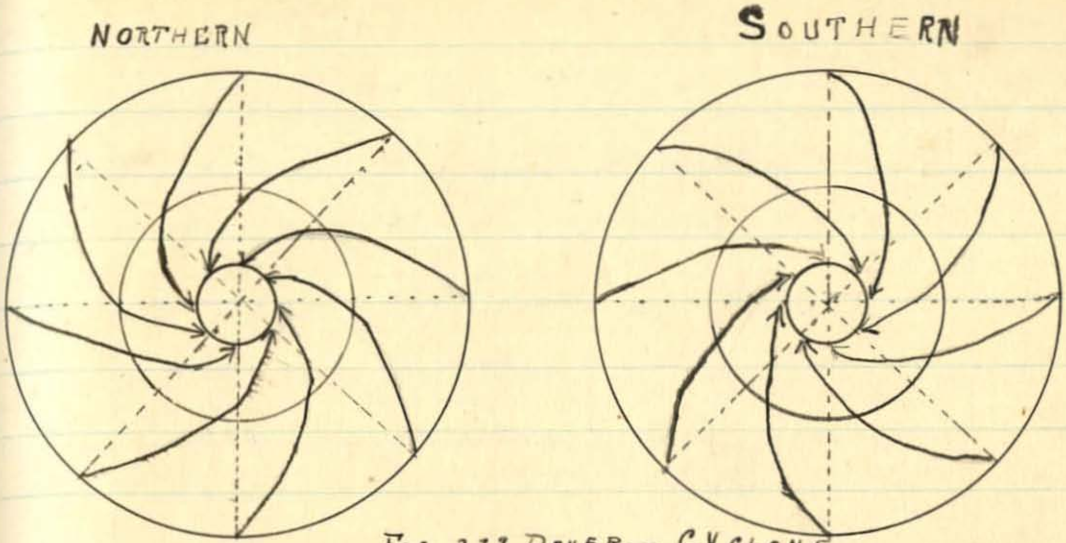


FIG. 277 DRYER — CYCLONE

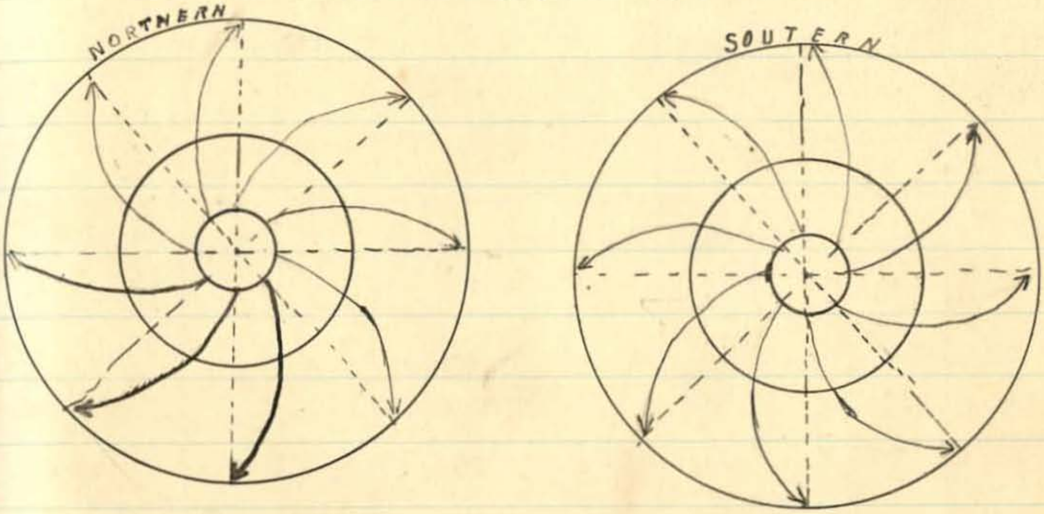


FIG. 278. DRYER — ANTICYCLONE

Air always moves from a region of high pressure to a region of low pressure, inversely proportional to the pressure slope.

WEATHER OBSERVATIONS

1911 A.D. DATE	HOUR	BAROMETER	DRY BULB THERMOMETER	~~WET BULB THERMOMETER~~ CHANGE IN TEMP FOR 24 HOURS	DIRECTION OF WIND	VELOCITY OF WIND	KINDS OF CLOUDS	PERCENTAGE OF SKY COVERED BY CLOUDS	FORM OF PRECIPITATION	AMOUNT OF PRECIPITATION	POSITION OF STORM CENTER INDICATIONS REMARKS
NOV	8:30	29.63	51°F		W of S	Light	ALTO STRATUS	◐ 90%	none	none	rained after
27											obersoration
MONDAY				3			F.B.				Ky. East High north Low
"	2:15	29.50	59°F		E of S	Light	ALTO STRATUS	◐ 70%	none	none	Changin 24 Hours of temp. 3°
			Heavy rain fell and high win								
AVERAGE FOR DAY		29.52½	55°		prevailed until about 10 P.m.						Kentucky
NOV	8:30	29.35	48°F	3°	S west	High	ALTO STRATUS	● 100%	Rain	Light	South East
28											of low press-
TUESDAY											ure E of high
"	2:15	29.52	44°F		S West	Brisk	STRATUS	● 100%	none	none	Chang in 24
			Light snow fell through the 24 hours								Hours of temp. 19°
AVERAGE FOR DAY		29.43½	46°								Kentucky
NOV	8:30	29.66	27°F	19°	S of West	mod	nimbus	● 100%	Snow	Light	East of High
29											South W of low
WEDNESDAY											
"	2:15	29.69	29°F		N West	Light	Nimbus	● 100%	none	none	Change in 24
			Snow fell after obersoration but light								Hours of temp. 1°
AVERAGE FOR DAY		29.67½	28°								
NOV 30	8:30	29.79	26°F	1°	S west	Brisk	Clear	○	none	none	
											Thanksgiving
THURSDAY											no record.
"	2:15	29.73	37½°F		S West	Brisk	Clear and Smokey	◐ 50%	none	none	
AVERAGE FOR DAY		29.76	31¾°								Change in 24
DEC 1	8:30	29.67	36°F	~~South W~~	S of west	moderate	Stratus	◐ 75%	none	none	Hours of temp.
				10°							10°
FRIDAY											Ky. North of High
"	2:15	29.54	47°F		S of west	Brisk	Stratus	◐ 80%	none	none	Swest of Low
AVERAGE FOR DAY		29.60½	41½								
AVERAGE FOR THE WEEK		29.60	44 2/5								

WEATHER OBSERVATIONS

1911 A.P. DATE	HOUR	BAROMETER	DRY BULB THERMOMETER	WET BULB THERMOMETER CHANGE IN TEMP FOR 24 HOURS	DIRECTION OF WIND	VELOCITY OF WIND	KINDS OF CLOUDS	PERCENTAGE OF SKY COVERED BY CLOUDS	FORM OF PRECIPITATION	AMOUNT OF PRECIPITATION	POSITION OF STORM CENTER INDICATIONS REMARKS
DEC	8:30	29.86	30°F		N.West	Light	Clear	○	none	none	In high
4											pressure
MONDAY											region and
"	2:05	29.86	38°F		N.East	Light	Clear	○	none	none	west of a
											Low pressure
AVERAGE FOR DAY		29.86	34°								Change in 24
DEC	8:30	29.85	36°F	6°	N.East	Light	Clear	○	none	none	Hours of tempera.
5											6°F Ky in S.W. of High.
TUESDAY											High in Va. & W.va N.E. of Low.
"	2:05	29.83	46°F		N.East	Light	Clear	○	none	none	Low in Arz.
AVERAGE FOR DAY		29.84	41°								Change in 24
DEC	8:30	29.87	45°F	9°	N.East	Light	Clear	○	none	none	hours of temp.
6											9°F.
WEDNESDAY											Ky S.West of High N.E. of Low
"	2:05	29.79	53°F		South	Light	Clear	○	none	none	High in Va & W.va.
AVERAGE FOR DAY		29.83	49°F								Change in 24
DEC	8:30	29.80	47°F	3°	S.East	Light	Commulus Stratus	◐ 65%	none	none	hours of temp.
7											3°F
THURSDAY											Ky West of High
"	2:05	29.81	59°F		South	Light	B altro stratus	◐ 80%	none	none	NEast of Low High in Col &
											W.va & Va
AVERAGE FOR DAY		29.80½	53								Low one cent Canada.
DEC	8:30	29.84	52°F	5°	S.East	Light	A altro stratus	◐ 75%	none	none	Change in 24 hours of temp
8											5°F
FRIDAY											Ky in high pressure
"	2:05	29.80	66°F		S.West	Light	Cirrus	◐ 50%	none	none	
											Low in Arizona.
AVERAGE FOR DAY		29.82	57°F								Average Temp
AVERAGE FOR THE WEEK		29.831	47⅕								50⅗°

WEATHER OBSERVATIONS

1911 A.D. DATE	HOUR	BAROMETER	DRY BULB THERMOMETER	~~WET BULB THERMOMETER~~ CHANGE OF TEMP IN 24 HOURS	DIRECTION OF WIND	VELOCITY OF WIND	KINDS OF CLOUDS	PERCENTAGE OF SKY COVERED BY CLOUDS	FORM OF PRECIPITATION	AMOUNT OF PRECIPITATION	POSITION OF STORM CENTER INDICATIONS REMARKS
DEC 11 MONDAY	8:30	29.54	63°F		S.West	Brisk	Fracto Nimbus	● 95%	Rain	Light	Kentucky South west of high Pressure Low in Tex and over Great Lakes.
"	2:05	29.56	64°F		S.West	Light	Nimbus	● 100%	Rain	moderate	
AVERAGE FOR DAY		29.55	63½°								
DEC 12 TUESDAY	8:30	29.55	54	9°	North	Brisk	nimbus	● 100%	Rain	Heavy	Kentucky South west of high Pressure Low in Lausona, Ohio & Penn.
"	2:05	29.57	55		N.East	Brisk	Nimbus	● 80%	Rain	Heavy	
AVERAGE FOR DAY		29.56	54½								
DEC 13 WEDNESDAY	8:30	29.64	43°	11°	N.East	Brisk	Stratus	● 75%	None	none	Kentucky in Low Pressure Low in Maine and in Arizona.
"	2:05	29.59	48°		N.East	Brisk	alto stratus	◐ 75%	none	none	
AVERAGE FOR DAY		29.61½	45½								
DEC 14 THURSDAY	8:30	29.46	46°	3°	N.East	Light	Nimbus	●	Rain	mod.	Kentucky S.west of High Pressure High in N.Y. Low in So. La. N Mex, and Ariz
"	2:05	29.37	51°		N.East	Light	Nimbus	●	Rain	Mod.	
AVERAGE FOR DAY		29.41½	48½								
DEC 15 FRIDAY	8:30	29.44	45°	1°	North	Light	nimbus	●	Rain	mod	
"	2:05	29.35	49°		N.East	Light	nimbus	●	Rain	Light	
AVERAGE FOR DAY		29.39½	47								
AVERAGE FOR THE WEEK		29.50 2/5	53.4/5								

WEATHER OBSERVATIONS

1911 A.D. DATE	HOUR	BAROMETER	DRY BULB THERMOMETER	CHANGE IN TEMPERATURE FOR 24 HOURS	DIRECTION OF WIND	VELOCITY OF WIND	KINDS OF CLOUDS	PERCENTAGE OF SKY COVERED BY CLOUDS	FORM OF PRECIPITATION	AMOUNT OF PRECIPITATION	POSITION OF STORM CENTER INDICATIONS REMARKS
DEC 18	8:30	29.85	35°		N West	Light	Clear	○	none	none	Ky in High Pressures Low of cost - of maine, Low in N mex, & Arizona, High in Oregon.
MONDAY											
" 18	2:15	29.84	44°		N.W.	Light	Clear	○	none	none	
AVERAGE FOR DAY		29.84½	39½								
DEC 19	8:30	29.84	36°	1°	N.E.	Light	altro stratus	◑ 40	none	none	Kentucky in High Pressure " over great lakes, Low in Texas.
TUESDAY											
"	2:15	29.74	46°		N.E.	Brisk	Ciro Stratus	◑ 80	none	none	
AVERAGE FOR DAY		29.79	41°								
DEC 20	8:30	29.49	42°	6°	N.E.	Brisk	altro stratus	● 90	none	none	Ky. in High Pressure Low in Kans. and Oklahoma High in washington.
		Slight rain after oberservation									
WEDNESDAY		continued until about noon.									
"	2:15	29.36	46°		N.E.	Brisk	altro Cirrus	● 100	None	none	
AVERAGE FOR DAY		29.42½	44°								
DEC 21	830	29.59	50°	8°	Sou.	Light	altro stratus	● 100	None	None	Kentucky in Low Pressure S. West of High Low in Utah, Iowa, and arizona.
THURSDAY											
"	2:15	29.56	54°		South	Lig	Strato Cumulus	◑ 90	none	none	
AVERAGE FOR DAY		29.57½	52°								
DEC 22	8:30	29.40	50°	0°	S.E.	Brisk	Nimbus	●	Rain	Light	Ky in High pressure. High of cost of Maine, Colo. and Kansas Low of Cost of Louisana.
FRIDAY											
"	2:15	29.29	52		S.E.	Brisk	Nimbus	●	Rain	Light	
AVERAGE FOR DAY		29.34½	51								
AVERAGE FOR THE WEEK		2957 3/5	45 3/5								

During my obersavation begining November 27. and ending December 22. 1914. I have noticed the following.

I. Temperature.

Averager 50$\frac{3}{5}$° F.
Highest. 66° F December 8th.
Lowest. 26° F November 30th
Range. 40° F
Greatest change in 24 hours 19° F November 29

II. Pressure.

Average pressure 29.63$\frac{3}{10}$.
Highest. 29.87° December 6.
Lowest. 29.35 " 22.
Range .52
Greatest change in 24 hours .35

III. Winds.

Highest winds 27-30 miles per hour.
Periods of low or Calm 22 days.
Direction that was most common. North east.

IV. Clouds.

No of obersavations totally cloudy. 16.
" " " partly " 15.
" " Days " Clear 6.
" " " — " 4.
" " obersavations " 9.

ASTRONOMICAL OBSERVATIONS

NAME OF PLANET, STAR OR CONSTELLATION	MONTH DAY HOUR						
	ALTITUDE						
	AZIMUTH						
	ALTITUDE						
	AZIMUTH						
	ALTITUDE						
	AZIMUTH						
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	AZIMUTH						

GEOGRAPHIC DISTRICTS
OF THE
UNITED STATES

After Davis, Powell and Others,

UPLANDS OF THE PRAIRIE DISTRICT:
First Upland or Cuesta..........
Niagara Upland or Cuesta- - - - - -

INDEX.

(Subjects not Printed may be Added in Writing.)

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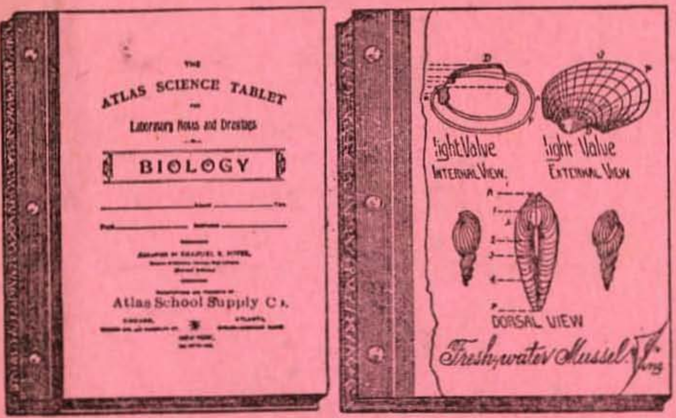

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