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Van Hise, Charles Richard, 1857-1918

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U. S. GEOLOGICAL SURVEY  
FIELD SECTION BOOK

9-891

# LAKE SUPERIOR DIVISION.

## INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted to one section. On the left-hand page, place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and number attached, showing the direction and amount of the dip. Denote a shaly or other very plainly bedded ledge by right parallel lines, and a ledge having a secondary structure by wavy parallel lines running in the direction of the strike, with dip arrow and number attached as before. The greatest care must be taken to avoid confusing slaty or schistose structure with bedding, and in all cases where there is the least doubt about the true bedding direction, indicate it by a query. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the spaces between the blue lines as 100 paces, and twenty of these spaces to one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black line above the bottom of the page, and at the right-hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up, or the map may be turned around and the north placed at the left-hand side of the page. The ruling of the left-hand pages is also arranged so that, if desirable, a larger or a smaller scale can be used, eight inches, two inches, one inch, or one-half inch to the mile. With the two-inch scale, the squares outlined in black represent sections, and those in red, quarter sections and "forties," while the space between the blue lines is 200 paces.

2. On the right-hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left-hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section and the dip and strike when observable, the latter always being expressed from the north; for instance 4025, 250 N., 300 W., *Strike, N. 78° E., Dip 50° S.* Then follow with a full description of the ledge. When topographical maps are used for locations this paragraph applies only in part.

3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of  $2 \times 2\frac{1}{2} \times \frac{3}{4}$  inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of  $3 \times 4 \times 1$  inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. Specimens should not be placed together without protection in the collecting bag, as the fresh surfaces, important in determining the character of rocks, are thus destroyed. They should be damaged by no temporary mark, but the numbers should be at once marked in at least two places upon the inclosing paper or cloth bags. Specimens may be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

4. On the last twenty-five pages of the book give, as may seem desirable, a general account of the examination of the region mapped in the previous pages, correlation of observations, sketches, cross sections, etc.

5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

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See Notebook 374.



Sep. 15, 1902

Came from Conception  
Sault to point where road  
first comes due to the  
pre-Cambrian rocks  
on way to Garden River.  
between Fall & mile  
north of Fall & Garden  
station. At point  
where are (first) tracks  
bluff there is an old  
road which goes  
north along the base  
of the bluff. Here  
the bed ledge of slate  
conformable lies to  
the west. It forms beautiful  
to walking - is quite  
a fine exposure. The  
rock is dark grey and  
is shown by the bands  
of fine red crumpled  
material. The strike  
is about N 60 W.  
In following the foot  
of the cliff to the west  
and on the bluff was

about to the N.E. The  
conglomerate becomes  
coarser and coarser until  
it is a coarse boulder  
conglomerate the dominant  
part <sup>of the</sup> being granite  
and showing low bedding.  
Following the ledge to  
the East one comes on  
the north west facing  
cliff of the limestone  
This limestone is five  
in a rather broad band  
it strikes N 75 W  
about and dips 60° to  
the N.E. The conglomerate  
and slate are in  
immediate contact with  
the limestone and at  
this point are under  
it the limestone evidently  
being original.

The contact of the lime-  
stone and slate was  
followed to the S.E.  
and after a short  
distance slate and

slate conglomerate is  
found both north and  
south of the  
limestone. At no  
place did I find the  
fine conglomerate  
to slate - these pieces  
of the same formation  
flipping over the  
of entire limestone  
formation. The fact  
which I saw at this  
limestone belt which  
I followed for at least  
a third of a mile  
might mean that  
we have here both the  
low slate conglomerate  
and the upper slate  
conglomerate, but the  
fact that the belt of  
conglomerate to the  
north is <sup>the limestone</sup> ~~the limestone~~,  
combined with the fact  
given by section and the  
described below indicate  
me to the belief that



all the conglomerate has  
found belongs above the  
limestone and that its  
position both north &  
then to help to explain  
our folding.

The present bluff to the  
north east is about  
1000 ft. or more from  
the state conglomerate  
and the limestone they  
are seen; but returning to  
the road old road  
we following it a short  
distance - in no way  
to the west - we  
first find state  
conglomerate then  
the limestone. The  
westward swing of the  
road is into the  
the slab and thus we  
begin to begin our  
high horizons.  
The climbing up the  
bluff and going in  
a south east direction





the granite - a 17  
Shut down to the north  
East of the street toward  
granite - across a little  
distance is found the  
granite chiefly in  
massive schistose granite  
rock cut by frequent  
fractures  
All the all the  
state employed  
found in the vicinity  
there can be no doubt,  
but whether any of the  
crystalline belongs  
with the limestone is  
uncertain. We therefore  
have no further evidence  
the any of the granite  
here is like other the  
limestone. If full  
conformable in present  
appears the limestone  
as be eroded between  
them & the north side  
perhaps exposed, but  
if this is so I estimate

It is not all to be  
by an unconformity between  
the two conglomerates.  
The north west end of the  
ridge at the place  
where it corresponds  
with the strike of the  
beds is that of a  
sharp ridge. It looks  
as if the two beds  
of the same nature  
that is to say, the  
beds of the west end  
of the ridge are  
all corresponding to the  
topography as shown the  
geological work  
the ground.

(At Sutherland the  
ground formed called  
the Leanderian but  
was supposed to be  
of Devonian age, a  
low plateau in place  
of the ridge with the  
diversity of the bedded series)



The succession of the  
Upper series above the  
limestone is conglomerate  
coarse - fine conglomerate  
below then granite the  
same as at Echo Lake

Sep 16. Examined the  
succession of rocks at  
Loon Lake near Wilds  
Station, Algoma Central  
Ry. To the northeast  
of the lake is Red  
Granite. To the south-  
west of the lake also  
a little way back from  
the shore is a granite  
and gneiss. To the  
south east of the lake  
the granite of the two  
sides appear close and  
other - indeed are merged  
by the Cleveburg range (priced  
map as coming together  
between the two granites  
is a Huronian Basin  
which opens out to the  
north west.

The relations of the  
granite to the Huronian  
rocks were first started  
on the south west side of  
the lake, but at first  
were not clear. But

on the north east side  
of the lake the strata at a  
slightly projecting point  
the red granite was  
found to be found at  
the waters edge and for  
a little way above by  
a beautiful slate-  
conglomerate which  
contains as the dominant  
fragments the imme-  
diately-subject granite  
in the well water worn  
boulders and pebbles.

Some of the boulders  
are a foot in diameter,  
and from this they vary  
decrease in size until  
they are lost in the  
slate matrix. Beside  
the red granite, there  
are other grey granites,  
various sized pebbles  
one that in diameter  
is equal to red  
jasper. The color  
The conglomerate is



separated from the granite  
with purple like sheen.  
Indeed the same granite  
seen by the rocks at the  
time of the deposition of  
the conglomerate is  
parted out into the  
sedimentary rock, and  
the separate beds in  
show the same smooth  
in texture in time.  
In the matter of Shapton  
a cleaner of contact,  
with the whitening so  
plain that a child  
can see it, I do not  
know the same seen  
thus one & all, a  
nuisance with me com-  
prehended its meaning  
upon a single application.  
Indeed the position of  
the line at the level  
clearly of the conglomerate  
reclined objects like the  
opinion see made the  
deposit against the ground

shore

Upon the south west side  
of the lake the succession  
of sediment is well shown  
at the lake end for some  
distance inland from the  
south west point of the  
lake strata are shown.

45887

These strata are first  
little altered, and very  
like the American strata  
Then strata of the same  
are gneiss and they  
are quartzite. The dips  
are steep to the south  
west from 60 to 80°.

South of the quartzite  
it is seen in again  
the conglomerate which  
rest upon against the  
gneiss and greenstone -  
showing the sedimentary  
bed to be an unusual  
syncline thus #10



This the true  
section.

The quartz was not seen  
on the north east side  
of the hill, but was found  
in the low place south east  
of the north east point  
of the island the  
quartz - at this point  
fills in the gaps.

The quartz when not  
affected by syenitic  
action is a grayish  
blue color, grayish  
like phre. But  
when the mica is  
in place, this is  
blue up to violet  
but gray. Indeed it  
is a syenitic free in  
or with - clear - such  
what has been removed  
with and impregnated by  
quartz - and hematite.  
At the place the  
various quartzes in  
the cement of quartz and  
hematite present a  
resemblance to conglomerate

45888



appearance, but the <sup>under</sup> fact  
is that the <sup>under</sup> fossils are  
all the same and are  
it goes unmitigatedly into  
a basin here on  
south of the red char-  
acter of the rock.

The extent of the  
sediments and the  
ground to the south west  
of the lake is not  
very good, but the  
south west (1) becomes  
4 miles or in the  
north west of a  
lake like other (2)  
become new extent  
sediments in size  
about (3) that  
be cause a black or  
gray shaly shales  
exposed the old times.  
This cut is in cut by  
is cut - the not quite  
clear, but full of many  
fossils. This divides  
in the dark woods and

was crossed by me to  
the other side, but  
the clear conglomerate just  
above the <sup>forwarding</sup> ~~main~~ <sup>conglomerate</sup>  
of the Boston Highwater  
shows the relations between  
the sediments and the  
granite to be the same  
as on the S.W. side.  
There

Small quartz layers  
exposed ~~and~~ to be  
to small like south of  
Linn Lake, and found  
the granite again after  
did not see.

Sept 17 Walked along by track  
from Wilde to Gravel  
23 1/2 miles to 9 miles  
Hyden <sup>to</sup> ~~from~~ Sault.

For first mile that is  
west to the 22 mile  
point the rock is the  
ancient green, somewhat  
siliceous, peculiar reddish,  
greenish or white weathering  
Archean greenstone cut  
extensively by red granite  
dikes and veins. In places  
the greenstone is somewhat  
schistose - in general it  
is broken into the peculiar  
th blocks, and in places  
is massive - There  
is no doubt of the Archean  
character of the greenstone  
I think after the 22  
mile point we see  
many fragments of slates  
crystalline but no  
outcrop. Here however  
no doubt the same  
belongs here. One



big block is full of  
granite pebbles similar to  
the granite seen at Leona  
Lake.

Before the 21 mile  
point is a red reddish  
red fine crystalline  
or red granite containing  
the small thin thin  
bands of crystalline  
with numerous red  
fine and light fragments  
of quartz. This is shown  
by crystalline bands  
striking N 80 W. dip  
70 South.

Just past the 21 mile  
point white granite could  
be seen from a distance  
slight layers are seen  
Here the strike is E-W and  
the dip 80 South.

It appears to be pure  
granite above the K. J. C.  
to the white granite above,  
but this granite is a different  
character of mass, indeed

which I examined closely off  
 at the side where red sheets  
 which at the time I took to be  
 granite, but after seeing the  
 peculiar quartz pebbles  
 I am somewhat in doubt  
 although one certain as I  
 remember it was gravel.  
 into which had cut straight  
 things like a granite etc.

The reddish varieties are  
as common as the blue  
white ones.

About 1/4 mile beyond  
the 20 mile post the green  
epithelium, chlorophyll and starch  
is again found - Similar  
in ~~the~~ <sup>the</sup> aspects to the at  
Wilde kept the in  
existing form is found  
in our life. The  
mud is well developed  
& almost white shell N 45  
E and dips 60 to the S E.

The ~~second~~ <sup>second</sup> green ~~stage~~  
is ~~found~~ <sup>found</sup> in ~~the~~ <sup>the</sup> ~~same~~ <sup>same</sup> ~~place~~ <sup>place</sup>  
but ~~it~~ <sup>it</sup> ~~is~~ <sup>is</sup> ~~not~~ <sup>not</sup> ~~so~~ <sup>so</sup> ~~well~~ <sup>well</sup> ~~developed~~ <sup>developed</sup>  
as the first one.

Continuing to past Bellview  
indeed to past the 18 mile  
post. For most of this  
distance there is little

ground vegetation, and  
many of the beds are  
very strongly eroded.  
The amygdaloid in places  
run up to two or three  
inches or more in diameter



and although there smells  
a good many crinoids  
The <sup>St.</sup> Amygdaloid bed,  
cutting into the  
dense beds led me to  
suppose on the trip up  
from the town that  
the beds about Baller  
to were the same Amyg-  
noid. Indeed I did not  
doubt this whereas the  
time out to a bed of  
Amygdaloid was  
seen.

43389  
After the 18 mile point  
is passed the first  
cut shows greenstone  
Cry. Crinoid at a  
rather prominent  
a good little greenstone  
fragments in the  
matrix. The fragments  
are well marked however  
and suggest a note  
some chert. The  
crinoid is a little  
at present to the

Concerning the Volcanic just  
 all or may all the fragments  
 for the Conference. but  
~~to~~ whether this was a  
 about a vision of fragments  
 or eyes after does not  
 appear

45890 Amygdaliferous  
 volcanic  
 45891 Vein in volcanic





S.

T.

R.

,

45894 must be put in  
England

the same conglomerate is  
found also in a few feet  
above ~~below~~ ~~some~~ conglomerate  
is found to contain  
~~green~~ ~~hell~~ ~~or~~ ~~small~~  
yellow and boulders of  
granite - red grey massive  
boulders etc. it lies far  
or far ~~from~~ ~~the~~ ~~entire~~  
fragments entire - ~~entire~~  
red ~~granite~~ ~~and~~ ~~red~~

45893

of the section is  
entire and the whole  
things it now suggest  
the original ~~original~~ conglomerate  
it is certainly  
like the conglomerate of  
the ~~Upper~~ ~~main~~  
Machipicote district.  
I can have no doubt  
from the variety of the  
material in the conglomerate  
that it is a ~~late~~  
formation. It is also possible

that the volcanic series  
belongs with the conglomerate







amount of unmetamorphosed  
granite. The granite  
is very abundant in  
granite until the 15  
mile part is reached,  
where the zone of  
rock is permeated with  
granite dikes. This  
core granite not  
cut by granite is almost  
entirely unmetamorphosed  
with the white veins  
for a mile south of  
middle, and I do not  
doubt that the series  
is unmetamorphosed below  
the granite employment  
is a low level and  
Saber River.

The distinct volcanic  
material associated with  
the employment, I am  
inclined to associate  
with the gabbros as it  
is there but the point  
may be determined  
by making a geologic map  
of the district.





in fact we expect these  
solid forms described as  
due to infolding beneath  
a basal conglomerate or  
granite and its accom-  
panying material. The  
difference is stated in  
the the granite does not  
form at the surface; here  
must be eroded; ~~the~~  
while the volcanic di-  
at the conglomerate may  
out mean much. When  
the other hand there is  
an opinion why the  
conglomerates may not  
show the same thing  
as when a granite granite  
contains in the volcanic  
country we would say  
was the conglomerate  
is the more series of  
the volcanic or the  
other series because of  
the joint relations, and  
probably detailed mapping in  
this region which will  
lead to some conclusions.

from 14 part 5 Heyden  
at the 13 part the granite  
injection is more abundant  
at Heyden the zone  
shown is injected parallel to the  
foliation in a very pretty  
fashion giving an injection  
of veins structure. The injection  
bands of granite very fine  
thin of fine streaks & dikes  
of granite a foot across or  
more.

It is very clear seen  
from the 11 mile part to  
the 13 the water-springs  
and eruptions as expressed  
by structure of ~~porphyry~~  
porphyry & schist which  
of character is proportionate  
to the abundance of the  
granite. The epithermal  
vents points in the  
most granite - phase.  
The amygdaloid structure  
was fairly rich (to be seen  
the 15 & 14)

White has no doubt  
of broken up & greenish  
to dark from 17 to 3 mil  
did not anywhere show  
distinctly the ellipsoidal  
structure or the structure  
of the broken.

Folys structure  
being the true of broken  
greenish and the  
rest a clear &  
gla. en. part of the  
Ogite. by the same  
for the whole the upper  
portion by me in the  
East end of the S.

From Hoyer & Grant  
as per your letter not  
clearly certain the  
I can see the point  
in the green stone is  
most more abundant,  
and may be abundant





