高知

第一  地質

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第一章 地質

一、結晶片岩層

高知 島田 （昭和三年七月編）

商工技師 鈴木 造夫
二 土荷鉱層

本層下部硅岩及千枚岩層上部角閃岩層コラ成

(一) 硅岩及千枚岩層

千枚岩

暗灰色或灰黑色薄板状千枚岩組

紫灰岩

細粒片岩

綠泥石片岩組

該層上部富硅石及細紫泥石組

千枚岩

千枚岩層上部角閃岩層コラ成

(二) 石灰岩

白色灰岩

灰白色至白色千枚岩組

总厚さ十米内外コラ成
岩中層は、本層は、緑色岩、泥岩、灰岩、シルト岩、砂岩、頁岩、頁状砂岩、頁状泥岩、頁状灰岩などの層を含む。

(1) 角閃岩層
- 角閃岩は、緑色または青色、または白色、または灰色を含む。
- 本層は、灰色、または白色、または黑色を含む。

(2) 綠泥岩層
- 綠泥岩は、緑色または青色を含む。
- 本層は、灰色、または白色、または黑色を含む。

三上部古生層

- 本層は、硅岩、または粘板岩、または砂岩、または頁岩、または頁状砂岩、または頁状泥岩、または頁状灰岩などの層を含む。
- 本層は、灰色、または白色、または黒色、または緑色を含む。

四出岩層

- 四出岩は、緑色または青色、または灰色、または黑色を含む。
- 本層は、灰色、または白色、または黑色を含む。
三宝山層

本層は灰色及び暗灰色の雲母角閃長石岩および短石岩、粘板岩を主要成分とする。層内には、長石、輝石、輝石英、粗粒石英、斜長石、角閃石、輝石、石英、白雲母、鉱物や化合物が認められる。

石灰岩

灰色及び暗灰色の雲母角閃長石岩、短石岩、粘板岩を主要成分とする。層内には、長石、輝石、輝石英、粗粒石英、斜長石、角閃石、輝石、石英、白雲母、鉱物や化合物が認められる。

頁岩

灰色及び暗灰色の雲母角閃長石岩、短石岩、粘板岩を主要成分とする。層内には、長石、輝石、輝石英、粗粒石英、斜長石、角閃石、輝石、石英、白雲母、鉱物や化合物が認められる。
五 下部三層

下部三層

下層ノ一層ハ石灰岩二層ノ又共一部ハ三層ヲ属スノチャートラ択メル部分ハ

石灰岩ノ轉石ノ見ルトアリ

亜石灰岩ノ轉石ノ見ルトアリ

亜石灰岩ノ轉石ノ見ルトアリ

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亜石灰岩ノ轉石ノ見ルトアリ

亜石灰岩ノ轉石ノ見ルトアリ
(三) 本層砂岩及び砂層

- 本層ハ頁岩ヲ主トシ頁岩砂岩ノ互層ヲ交ヘ前記ノ砂岩頁岩互層ニ比シチョウ

- 岩質ニシテ泥質粘土含ム厚サ通常米乃至十米ナルモ厚サ一米内外ナルモ岩ト層線ヲ成セルモノヲアリ

- 砂岩ナシテ暗灰色ナリ暗灰色細粒ニシテ主トシテ石英及び長石ヨリ成リテ結晶岩々片

- 岩層ヲ함ノ層線ヲ含ム厚サ通常米乃至十米ナルモ層線ヲ成シ頁岩ト互層セ

- 産地域ニ於テ伊尾木川-Jul约Digits米以内ニ於テ比ノ産地域ノ産地ニ於テハ頁岩砂岩ノ層線ヲ観察セリ

- 産地域ハ西ノ富士山瓦斯孔ノ東北東ヲ出テ南西ヲ向テ延長ノ数キヲ示スノバ外ノノ岩ヲ錯綜セリ

- 岩層ヲ分ノ第一シテ頁岩砂岩ノ互層ヲ交ヘ前記ノ砂岩頁岩互層ニ比シチョウ

- 本層ハ砂岩ノ上部ニ占メ其厚サ尾川ノ于テ約千二百米ノ延長ノ数キヲ示スノバ外ノノ岩ヲ錯綜セリ

- 砂岩ナシテ暗灰色ナリ暗灰色細粒ニシテ主トシテ石英及び長石ヨリ成リテ結晶岩々片

- 岩層ヲ含ム厚サ通常米乃至十米ナルモ層線ヲ成シ頁岩ト互層セ

- 産地域ニ於テ伊尾木川-Jul约Digits米以内ニ於テ比ノ産地域ノ産地ニ於テハ頁岩砂岩ノ層線ヲ観察セリ
八奈半利川層

本層は主に中・厚層の砂岩及び頁岩を含む。灰色層及び頁岩は、長石を主成分にし、片麻状及び花崗岩を含む。

頁岩層は、灰色又は灰白色、また長石を含む。

砂岩層は、灰色又は灰白色、長石を含む。

断層：本層は南東方及び南西方向に傾斜する。

層名：八奈半利川層

層厚：約100〜300m

産状：南東方及び南西方向に傾斜する。

岩相：頁岩層、砂岩層、長石を含む。

結晶：灰色又は灰白色、長石を含む。
九 鮮新層

本層は上部から下部にかけて、長石砂岩の層が卓越する。本層は約五米厚である。

水分

固形分

固定炭素

該当質分

灰分

密度

発熱量

砂岩質

灰色とシアン色の層が重複する。長石砂岩の層が、約五米厚である。

アサトシタ石英及び長石、磁鉄鉱の層が重複する。

ヘレン層及び角閃輝石の層が重複する。

本層の砂岩層の中には、ハドリ石英が混入している。

安山田村の大野山、伊豆木村の大穴山、及び安田村の内村山など

産出される。

モリノ層に相当する。
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>8. Diphthong sounds</td>
<td>9. Stress and accent</td>
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<td>6. Prosody</td>
<td>7. Pitch and tone</td>
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<td>5. Stress</td>
<td>4. F. Ornamental voices</td>
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<td>3. P. Ornamental voices</td>
<td>2. Ornamental voices</td>
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<tr>
<td>1. Ornamental voices</td>
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</tbody>
</table>
十一 蛇紋岩

濃緑色或灰色為蛇紋岩，以蛇紋石及輝石為主要成分，常見於基岩帶。

本層為砂岩及粘土岩，成層為高硫帯及河川泥岩，推測為

十二 境界

綠泥石及輝石磁鐵礦為蛇紋岩，常見於基岩帶。

本層為砂岩及粘土岩，成層為高硫帯及河川泥岩，推測為

十三 煙呑岩

押谷大野柳井瀬等一層為和田青石及白雲母石，常見於基岩帶。
二 満喰鏡

三菱苦土石

長岡郡大和村内郁色を含む、母岩を含む、約八度傾斜の層疊。岩中には、亜鉛シリカ質の不規則形の菱苦土石が含まれる。

石灰岩

昌明宮南部村八丁目、隠岐ノ宮、丹波石の近辺に存在する。約三十五乃至四十トン、色は白、形状は不規則。この石灰岩は、亜鉛シリカ質の不規則形の菱苦土石が含まれる。
五
土

六
畑土

石材

畑土ニハ更新層及現世層ノ粘土ヲ利用シ主トテ田畑地ヨリ採取シ良土ヲ

焼成ス

検土ノハ更新層及現世層ノ粘土ヲ利用シ主トテ田畑地ヨリ採取シ良土ヲ

奈良利用層ノ砂岩ヲヨリ石垣石築石ヲ主ナル用途トシ他ハ築工ヲ

部落ニヨテ使用セルヲ過モス

土トシテ採取シ良土ヲ

主トテ田畑地ヨリ

畑土ニハ更新層及現世層ノ粘土ヲ利用シ主トテ田畑地ヨリ採取シ良土ヲ

焼成ス

検土ノハ更新層及現世層ノ粘土ヲ利用シ主トテ田畑地ヨリ採取シ良土ヲ
EXPLANATORY TEXT
OF THE
GEOLOGICAL MAP OF JAPAN
Scale 1:75,000

KōCHI
Zone 32 Col. XVII
Sheet 243
By
Tatsuo Suzuki

(Abstract)

GEOLOGY

Crystalline Schists (Pre-Carboniferous) are the alternations of sericite-schist and chlorite-schist. Certain sericite-schist is a little metamorphosed and looks like the mica-phyllite of the Mikabu Series. The schists have a plane of schistosity generally running from northeast to southwest and are mostly monoclinal towards northwest, although they are partly folded to form a syncline. They are separated by faults from the Mikabu Series.

Mikabu Series (Pre-Carboniferous) is composed of the alternations of quartzite and phyllite in the lower part, and the amphibolite in the upper. The phyllite intercalates limestone layers. The rocks have a general strike E.N.E., and are on the large scale folded into a syncline. They are
bounded by faults on all sides, but are considered to be younger than the Crystalline Schists and older than the Upper Palaeozoic (Permo-Carboniferous).

**Upper Palaeozoic** is made up of the alternations of quartzite and clayslate in the lower part and the alternations of sandstone and clayslate in the upper. The former, accompanied by sandstone, limestone and schasite, occurs on the north of the latter with a fault between, and is folded with the axes running nearly E. N. E.—W. S. W. The latter also intercalates hornstone, limestone and schasite, and is equally folded with the axes running in parallel with those of the former. The limestone in the latter contains fossils of *Neochougerina* and *Pasulina*, which are of Permo-Carboniferous in age. The whole complex is separated by faults from the neighbouring Jurassic or Cretaceous rocks.

**Sambusan Series** is a part of the Upper Palaeozoic mentioned above holding in its area the Triassic strata whose rocks can hardly be discriminated from those of the Upper Palaeozoic. The Triassic strata consist of sandstone and shale, with subordinate chert, limestone and schasite. The limestone at Sambusan is made by the presence of *Rynchochella sambusana* Kobyashi, besides *Omeella* cf. *Kotov* Mej. var. *alta* Yabe and Shimizu. In the chert at several horizons are found *Spheerococcus*, *Cenosphera*, *Dictyomitra*, *Lithascope* and some other radiolarias. Although the strata are traversed by several faults, yet they maintain in the eastern district the general strike of from east to west and the dip 40°—60° to north, and in the central and western districts the general strike of from northeast to southwest and the dip 50°—80° to northwest. The formation is disconnected by faults from the adjacent others.

**Lower Triassic** consists of alternations of sandstone and shale, which have the strike east-west and the dip 60° to north. In the area occupied by this formation are found boulders of limestone which must have been interstratified in the formation. The limestone furnishes abundant fossils of *Pandemonium*, *Fucus*, *Gerailleta*, *Myallina*, *Myophoria* and *Avocantophora*.

**Jurassic** is divisible into the Akigawa and Torinosu Series.

**Akigawa Series** is again subdivided into the three parts as follows, in ascending order:
- Shale beds
- Alternating beds of sandstone and shale
- Shale-sandstone beds

Cherts are found intercalated in every part and are rich in such fossils of Radiolaria as *Cenosphera*, *Dictyomitra* and *Spheerococcus*. The Series has a strike from northeast to southwest and dips either to northwest or to southeast as to form a large syncline. It is separated from the Torinosu Series by fault and is covered by the Tertiary formation.

**Torinosu Series** is a group of sandstone and shale, characterized by the insertion of so-called "Torinosu limestone", besides some cherts and conglomerates. The limestone abounds in fossils of *Anthozoa*, *Tabulata*, *Hydrozoa*, *Crinoidae*, *Bryozoa* and *Gasteropoda*, and the chert is rich in Radiolarian skeletons.
The Series strikes from east to west in the eastern and western parts of the sheet-area, while it runs from northeast to southwest in the middle part, and is altogether irregularly folded. The Series is bounded by faults on all sides.

Cretaceous consists of the following two divisions:

Lower—Alternating beds of sandstone and conglomerate, associated with shale.

Upper—Shale beds with sandstone.

Among the lower beds, the gray sandstone and shale contain so-called “Ryoski” plant fossils, and the green sandstone keep *Trigonia pociilliforitis* Yoke. The shale of the upper beds yields such fossils as *Panoria dissonons* Stol. and *Acmeboiceras rotomagense* Defr.

In general the complex has the strike east-west and the dip 40°-80° to northwest, but it is often faulted to form irregular blocks with different strikes or partly folded into a syncline. It lies unconformably on the Palaeozoic and is separated by faults from the adjacent other formations.

Naharigawa Series consists of sandstone in the lower part, and the alternating beds of sandstone and shale with conglomerate in the upper. The strike of the strata is mostly from north-north-east to south-south-west and the dip is 30°-70° towards west-north-west, but partly towards east-south-east as to form a syncline. The age of the series is unknown, but from its lithological characters, it is probable that it would not be older than the upper Mesozoic and younger than the lower Tertiary.

Pliocene occupies small areas and is composed of conglomerate, sandstone and sandy shale. The strata are nearly horizontal or dip towards south with small angles, and unconformably cover the Akigawa and Naharigawa rocks. In the sandstone many shell fossils are found.

Pleistocene consisting of sand, clay and gravel, forms terraces along the sea-coasts and rivers.

Recent made up of sand, clay and gravel forms low plains along the rivers.

Serpentine and Diabase are found intruding into the Palaeozoic and Cretaceous rocks.

**ECONOMIC GEOLOGY**

Copper Ore was formerly produced from the Hōgashō mine in Aki-gun and the Asahj mine in Kami-gun, but now these mines are abandoned.

Manganese Ore is worked at the Ananai mine in Nagasaki-gun, where it is found as a bedded deposit accompanying some impregnations in the Palaeozoic hornstone. The ore-bed strikes from east to west and dips towards south with steep angles. It has a length of about 1,000 metres and attains a thickness of about 3.5 metres. The ore consists of psilomelane, rhodochrosite and manganiferous iron ore, and is said to contain 35-40 percent of manganese, but its production is very small, being only about 10 tons in a month.

Magnesite is found as larger or smaller masses irregularly distributed in the Torinou limestone on the south of the city of Köchi, but it is not of economical importance.
Limestone interstratified in several rock series already mentioned is quarried for lime and building-stone, the most important being found in the Sambōsan series.

Porcelain Clay is get from the Pliocene beds at several localities, especially at Uchiwarano, Nōsoyama and Shingai.

Potter's Clay is found in the Pleistocene and Recent beds, and is used for manufacturing tile and terra-cotta.

Building-stone is dug for local use from quarries of limestone of every age and sandstone of the Cretaceous and Naharigawa formations.