昭和十年三月

卯之町

縱行一九橫行三三
圖幅第二四九號

地質說明書

地質調査所

卯之町縦行一九横行三三圖幅第二四九號 地質說明書

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卯之町 縦行一九横行三三 圖幅第二四九號 地質說明書

（昭和九年稿）

商工技師 鈴木達夫

第一章 地質

一、前石炭系—御荷鉾統

本圖幅北西隅ノ小地域ニ露出セル本統ハ北隣久万圖幅地内ニ於テ廣大ナル地積ヲ占ムル御荷鉾統ノ連續ナリ.本圖幅地内ニ於テハ久万圖幅地内ニ於ケルヨリモ綠簾綠泥片岩厚ク發達シ之ニ石墨片岩ヲ伴フ

綠簾綠泥片岩 綠色或ハ濃綠色ヲ呈シ厚サ三糎内外ノ薄板ニ剝離ス.之カ薄片ヲ顯微鏡下ニテ檢スルニ粒狀又ハ柱狀ノ綠簾石及綠泥石ヲ主トシ石英粒ヲ交ヘ鱗狀變晶質構造ヲ示ス

石墨片岩 黑色ヲ呈シ板狀ニ剝離シ主ニ石墨及石英ヨリ成リ細鱗片狀ノ絹雲母.粒狀ノ綠

泥石、八面體ノ磁鐵鑛及片狀赤鐵鑛ノ小結晶ヲ雜ヘ、鱗狀變晶質構造ヲ示ス

構造　本統ハ走向北七十度東、傾斜北方ニ五十度乃至八十度ナル單斜層ヲ成ス、而シテ其南邊ハ久米村下里ヨリ平野村矢口ニ亙リ北東ヨリ南西ニ走レル斷層ヲ以テ南方ノ久米統ニ接セリ

二、久米統

本統ハ愛媛縣喜多郡南久米村附近ヲ中心トシテ發達セルヲ以テ假ニ久米統ト稱セリ、主トシテ千枚岩ヨリ成リ石灰岩、砂岩、硅岩、鄙綠凝灰岩ヲ伴ヘリ

千枚岩　綠色或ハ灰色ヲ呈シ、綠色千枚岩ハ綠泥石質物及細粒狀ノ粘土質物ヨリ成リ、灰色千枚岩ハ長石、石英ノ細粒ヲ粘土質物ニテ膠結セルモノナリ、共ニ緻密堅硬ニシテ厚サ一糎內外ノ板狀ニ剝ケ易シ、是等兩種ノ岩石ハ互層ヲ成シ各層ノ厚サハ普通十米乃至二十米ナルモ厚キモノハ百米ニ達ス

砂岩　灰色ヲ呈シ細粒質ニシテ石英及長石ヨリ成リ、働力變質ニヨリ板狀ニ剝離スル性アリ、厚サ五米乃至十米ナリ

硅岩　白色或ハ灰色ヲ呈シ緻密ニシテ成層理ヲ示サス塊狀ノモノ多シ、主トシテ石英ノ粒狀結晶ヨリ成リ稀ニ長石ヲ交フ、一層ノ厚サ五米乃至十米ナリ

石灰岩　白色ヲ呈シ、粒狀結晶質ニシテ綿狀ノ薄キ綠色粘板岩ヲ挾ミ、厚サハ一米乃至五米ナリ

輝綠凝灰岩　紅色或ハ綠色ヲ呈シ、一般ニ紅色ノモノ多クシテ綠色ノモノニ遷移セリ、主トシテ塊狀ニシテ片理ナキモ時ニ板狀ノ剝理ヲ示ス、細粒或ハ微晶ノ赤鐵鑛粒狀或ハ片狀ノ綠泥石、柱狀或ハ粒狀ノ綠簾石ヲ含ミ、之等ハ凝灰質物ニヨリテ膠結セラル、殊ニ紅色ノモノニハ赤鐵鑛多シ、屢々石灰岩ヲ伴フ、厚サ普通五米內外ナリ

構造　本統ハ前記セルカ如ク北方ノ御荷鉾統トハ斷層ヲ以テ接シ、南方ノ秩父系トハ亦大成村森山南久米村梅川、田之筋村鳥坂ヲ通スル走向東北東—西南西ノ斷層ニヨリテ界セルノミナラス、分布地域內ニモ二、三ノ主要走向斷層アリテ其中菅田村野地、南久米村黑木、平野村梶谷ヲ通シ北東ヨリ南西ニ走ルモノ及菅田村大竹、南久米村山中及北浦ヲ通シ北東ヨリ南西ニ走ルモノニヨリ久米統ノ地域ハ北部、中部及南部ノ三區域ニ分タル

北部區域ノ久米統ハ主トシテ綠泥質千枚岩ヨリ成リ灰色千枚岩及硅岩ヲ挾有シ、走向東西乃至東北東、傾斜北方ニ六十度內外ニシテ單斜層ヲ成セリ

中部區域ノモノハ主トシテ灰色及綠色千枚岩ヨリ成リ砂岩及硅岩ヲ伴ヘリ、岩層ハ東北東

ニ走リ北々西ニ急斜スルヲ一般トスルモ平野村梶谷ニ於テ走向北六十度東傾斜南東方ニ四十度菅田村追打ニ於テ走向北七十度西傾斜南西方六十度内外ナリ南西部菅田村大竹南久米村札掛北浦附近ニ於テ各走向北三十度東傾斜南東方四十度走向北二十度西傾斜南西方ニ六十度走向東西傾斜南方六十度ナル等走向及傾斜ノ混亂セル處ハ斷層ノ通過スル附近ニシテ構造線ノ存在ヲ示ス所ナリ南部區域ノモノハ灰色千枚岩層中ニ結晶質石灰岩輝綠凝灰岩及硅岩ヲ伴フモノヨリ成リ走向ハ約東西ニシテ北方ニ二十五度乃至六十度傾斜セリ

時代　本統ハ前記セルカ如ク三區域ニ分カレ各區域ハ斷層ヲ以テ相接スルカ故ニ相互ノ關係不明ナルモ岩石變質ノ程度ハ北部ノモノ最モ甚シク南部區域ニハ石灰岩アリ其中ヨリハ未タ化石ヲ發見セス隨テ時代全ク不明ナルモ組成岩石ハ南方ニ接シテ存スル上部古生代ノ秩父系ノ岩石ヨリ變質著シク之ヨリ古期ノモノタルヘク寧ロ北方ノ御荷鉾統ト共ニ前石炭系ニ屬スルモノナラン

三、上部古生界—秩父系

本系ハ圖幅地ノ北半部ヲ占メ廣ク發達セリ粘板岩砂岩角岩石灰岩及輝綠凝灰岩ノ累層ヨリ成リ斑糲岩蛇紋岩輝綠岩ニヨリテ貫通セラル輝綠凝灰岩ハ東部即チ高知縣檮原村愛媛縣

檮川村ニ於テ著シク發達シ角岩ハ諸地ニ現出セルモ殊ニ宇和町中川村田ノ筋村中筋村地内檮原村烏帽子岳ノ連山日吉村ノ御在所山ヨリ下宇和村ノ鬼長峠ニ亙ル連山ニ多シ石灰岩ハ大野ケ原及之ニ續キテ土佐伊豫ノ國境ニ著シク厚層ヲナシテ發達シ又鬼長峠ノ連山ニ於テ東西ニ亙リ賦存セリ

粘板岩　灰色暗灰色黑色或ハ綠色ヲ呈シ黑色ノモノハ最モ稀ニシテ普通灰色或ハ暗灰色ナリ緻密堅硬ニシテ板狀ニ剝離ス時ニ長石及石英粒ヲ含ミ砂質ノモノアリ綠色ノモノハ稍硅質ニシテ綠泥質物ヲ含有シ黑色ノモノハ炭質物ヲ含ム本岩ハ普通一層五米乃至十米毎ニ砂岩角岩等ト互層スルモ時ニ一層ノ厚サ百米ニ達スルコトアリ

砂岩　本岩ハ一層ノ厚サ一米乃至二十米毎ニ粘板岩角岩等ト互層ヲナス灰色或ハ暗灰色ヲ呈シ細粒ニシテ成層理ナキ塊狀ヲ成シ時ニ板狀ニ剝離ス一般ニ細粒ノ石英長石雲母磁鐵鑛及有色鑛物ヨリ成ル

角岩　白色灰色或ハ紅色ヲ呈ス緻密無層理塊狀ナルモ時ニ淡色ノモノト濃色ノモノト厚サ三糎内外毎ニ交互シテ縞狀ヲ成シ時ニ小褶曲ヲ示セルモノアリ白色ノモノハ主トシテ細粒ノ石英ヨリ成リ硅質物ニテ膠結セラル灰色ノモノハ細粒或ハ微粒ノ石英ヨリ成リ暗灰色ノ微粒硅質物ニヨリテ膠結セラル又紅色ノモノハ同シク硅質ナルモ細粒ノ赤鐵鑛及粘土質

物ヲ含ミ之ニ放散蟲ノ形骸ヲ混フルコトアリ粘板岩砂岩ト互層シテ普通一層ノ厚サ一米乃至五米ナルモ時ニ二十米ニ達スルコトアリ

輝綠凝灰岩　綠色或ハ紅色ヲ呈ス普通塊狀ニシテ成層理ヲ示サヽルモ稀ニ層理面ニ沿ヒテ板狀ニ剝離ス本岩ハ綠泥石蛇紋石綠簾石及綠色潛晶質物ヨリ成リ紅色ノモノニハ赤鐵鑛ノ細粒結晶ヲ含ミ普通一層ノ厚サ一米乃至二十米ニシテ粘板岩砂岩角岩ノ累層中ニ介在スルモ厚キモノハ百米以上ニ達ス

石灰岩　白色或ハ灰色ヲ呈ス主トシテ細粒狀ノ方解石ノ集合ヨリ成リ層理ナク塊狀ナリ時ニ潛晶質石灰質物ヲ交ヘ又鯛狀ヲ呈スルコトアリ普通ハ粘板岩中或ハ輝綠凝灰岩中ニ介在シ扁桃狀ヲ成シ厚サ一米乃至五米延長百米內外ナルモ大野ケ原ニ於ケルモノハ厚サ二十米乃至五十米延長數粁ニ達ス本岩中ニハ屢々紡錘蟲石蓮蘇蟲類ノ化石ヲ含ム

構造　本系中ニハ多數ノ斷層アリ其主ナルモノハ檮原村越知面ヨリ野村町木落（コオトシ）ニ亙レル越知面斷層檮原村高野ヨリ土居村中津川ニ亙レル高野斷層及日吉村相林ヨリ法華津峠ニ亙レル法華津斷層是レナリ

越知面斷層ハ東北東ヨリ西南西ニ走リ東方ハ遠ク須崎伊野及高知圖幅地マテ連レルモノニシテ四國ノ南部ヲ約東西ニ亙リ中生層ト上部古生層間ニ現出セル一大構造線ナリ本斷層

ハ衝上斷層ノ疑ヒアルモ其傾斜角度急ニシテ直立セル處多シ

高野斷層ハ東隣ノ須崎及高知圖幅地ニ連續シ其北側ノ秩父系ト南側ノ安藝川統或ハ島ノ巢領石統トノ境界ニ在リ斷層線ヲ辿ルニ北方傾斜ノ斷層ニシテ之カ爲メ秩父系ハ安藝川統上ニ衝上セルカ如キ觀アリ

法華津斷層ハ其北側ノ秩父系ト南側ノ安藝川統トノ境ヲ成ス屢々斷層ニ沿ヒ壓碎角礫岩ト推定セラル、礫岩層アリ是レ亦高野斷層ト同シク一衝上斷層ナランカ

本系ハ一般ニ北方ニ傾斜セル單斜層ヲ成セルモ處ニヨリテ走向ノ擾亂セル所或ハ彎曲セル所アルノミナラス亦多數ノ斷層ニヨリテ截斷セラル是等ノ斷層ニハ略東西ニ走レル走向斷層及略南北ニ近ク走レル斜斷層アリ概ネ正斷層或ハ逆斷層ニ屬ス

次ニ各地ノ一般走向傾斜ニツキ概說スレハ東部ニ於テハ走向約東西傾斜北方ニ四十度乃至八十度西部中筋村溪筋村ニ於テハ走向北四十度乃至七十度西傾斜北方ニ三十度乃至七十度ナリ田ノ筋村中川村ニ於テハ走向東西傾斜北方ニ四十度乃至八十度又檮原村高野附近ニ於テハ走向東西ヨリ北五十度西ニ彎曲シ北東ニ向ヒテ傾斜セリ齒長峠御在所山ノ連山ニ於テハ走向北東ヨリ東西ニ彎曲シ法華津峠附近ニ於テハ走向北六十度西ナルモ西方ニ進ムニ從ヒ東西ノ走向ヲ現出シ何處モ皆傾斜ハ北方ニ向フ

本系ノ岩層ノ厚サハ檮原村越知面柳谷村方面ニ於テ概算スルニ約八千米アルモ此間ニハ多數ノ斷層アルヲ以テ實際ノ厚サハ是ヨリ遙カニ薄キモノナルヘシ

化石　本系中ノ石灰岩ハ二疊紀及石炭紀ノ時代ヲ指示スル化石ヲ埋藏ス、小官ノ發見セル産地及化石名次ノ如シ(小林貞一學士鑑定)

高知縣檮原村大田戸—猪伏越	*Neofusulinella* sp.	
	Verbeekina sp.	
	Neoschwagerina cf. *simplex* Ozawa	
高知縣高岡郡檮原村松谷ノ奥	Bryozoa, Crinoid stem	
愛媛縣東宇和郡土居村川ノ中	*Fusulina* sp.	
同　野村町猿坂峠	*Neoschwagerina* sp.	
同　魚成村中成	*Neoschwagerina* sp.	
同　高川村宮ノ裏	*Neoschwagerina japonica* Gümb.	
同　横林村坂石	*Neofusulinella* sp.	
同　溪筋村鳥鹿野	*Neoschwagerina* sp.	
同　中筋村惣財久	*Fusulina* sp.	

同　御在所山	*Fusulina* sp.	
同　松山	〃	
同　大谷村廣常中成	*Fusulinella* sp.	
愛媛縣上浮穴郡柳谷村中久保	*Fusulina* aff. *granum-avenae* Roemer	
同北宇和郡三間村宮下—明間	*Fusulina* sp.; *Neoschwagerina* sp.	

四、虛空藏山層

本層ハ東隣ノ須崎圖幅ニ於テ廣域ニ發達セルモノヽ、本圖幅地內ニ連續セルモノニシテ之ト同樣ニ上下二層ニ別ツヲ得、其內下部層ハ明カニ上部古生界(石炭系及二疊系)ニ屬スルモ上部層ハ三疊系タル疑ヒアリ、唯二疊系ト三疊系トノ境界ヲ確定スルコト能ハサルニヨリ、須崎圖幅ト同樣ニ三疊乃至上部古生界ノ虛空藏山層トシテ一括シテ記載シタルモ、下部層ハ本地質圖ニ於テハ秩父系トシテ塗色シタリ、故ニ玆ニ云フ虛空藏山層トハ須崎圖幅ノ虛空藏山層ノ上部層ノ謂ナリ

本層ハ圖幅內ノ東部ニ發達シ、北方ノ島ノ巢領石層トハ東西ニ走レル斷層ニ依リ境シ、南方ノ秩父系トハ其上位ニ整合的ニ累重ス、本層ハ頁岩、砂岩及硅板岩ノ累層ヨリ成ル

頁岩　灰色或ハ暗灰色ヲ呈シ普通ハ緻密堅硬ニシテ成層理ヲ現スモ時ニ柔軟ニシテ露出面ニ於テ容易ニ小片ニ破碎スルモノアリ一層ノ厚サハ普通一米乃至五米ナルモ時ニ二十米ニ達シ概シテ砂岩ト互層ス

砂岩　灰色或ハ暗灰色ヲ呈シ主トシテ細粒質ノモノ多ク時ニ中粒質ノモノアリ一般ニ石英粒及長石粒ヨリ成レルモ時ニ粘板岩ノ小破片雲母磁鐵鑛等ヲ混ヘ成層理ヲ現サス塊狀ナルコト多シ一層ノ厚サ一米乃至十米ニシテ頁岩ト互層スルコト多シ

硅板岩　灰白色灰色或ハ暗灰色ヲ呈ス一般ニ緻密堅硬ナリ時ニ厚サ五糎内外ノ淡色部ト濃色部ト縞狀ノ成層理ヲ現シ美麗ナル褶曲層ヲ現出セルコトアリ一層ノ厚サ一米乃至十米ニシテ頁岩中ニ夾マルヽコト多シ

構造　本層ハ上部古生層ノ上位ニ整合的ニアリ走向東西傾斜北方ニ六十五度ニシテ單斜層ヲ成ス北方ノ島ノ巢領石層トハ東西ニ亙レル斷層ヲ以テ接シ岩層ノ厚サハ七百米内外ナリ

五、三疊系

本系ハ愛媛縣東宇和郡魚成村田穗附近ニ於ケル二條ノ東西ニ亙レル斷層間ニ狹長ナル小區域ヲ占メ砂岩頁岩石灰岩及硅板岩ヨリ成リ厚サ三百米内外アリ

砂岩　灰色ヲ呈シ成層理ナキ塊狀ヲ成ス細粒質ニシテ石英長石雲母磁鐵鑛ヨリ成ル一層ノ厚サ一米乃至五米ナリ

頁岩　灰色或ハ暗灰色ヲ呈シ稍緻密堅硬ニシテ成層理アリテ板狀ニ剝離スルモノ或ハ無層理塊狀ノモノアリ一層ノ厚サ二米乃至十米ナリ

硅板岩　白色或ハ灰色ヲ呈シ緻密堅硬層理ナキ塊狀ノモノ多シ時ニ白色部ト灰色部ト厚サ五糎乃至二十糎毎ニ交互シ縞狀ノ層理ヲ表ス而シテ厚サ五米内外ノ厚サヲ以テ砂岩頁岩中ニ介在ス

石灰岩　灰色ヲ呈シ細粒結晶質ノ方解石ヨリ成ル魚成村田穗ニ於ケル石灰岩ハ厚サ二米内外ニシテ其中ニ化石ヲ埋藏セリ

構造　本層ハ走向略東西傾斜北方ニ七十度内外ノ單斜層ヲ成シ北方ノ上部古生層及南方ノ島ノ巢領石層トハ各東西ニ亙レル二斷層ニ依リテ接シ其間ニ陷沒セル地塊ヲ成ス

化石　本層ノ石灰岩中ヨリ採集セラレタル化石ハ江原眞伍博士(S. Yehara: The Lower Triassic Cephalopoda and Bivalve fauna of Shikoku, Japanese Jour. Geol. and Geogr. Vol. V, No 4, 1924)及清水三郎博士(愛媛縣東宇和郡魚成村田穗上組ノ下部三疊紀アムモナイト)ニ就テ地球十九卷第一號昭

和八年ニヨリテ記載セラレタリ其屬種名次ノ如シ

Meekoceras japonicum Shimizu and Jimbo

Meekoceras aponicum tenue Shinmizu and Jimbo

Meekoceras kuharanum Yehara

Meekoceras kuharanum compressum Shimizu and Jimbo

Meekoceras morianum Yehara

Meekoceras shikokuense Shimizu and Jimbo

Meekoceras orientale Shimizu and Jimbo

Meekoceras katoi Yehara

Meekoceras sawatanum Yehara

Meekoceras tahoense (Yehara)

Meekoceras obscurum Shimizu and Jimbo

Anasibirites multiplicatus (Yehara)

Anasibirites onoi (Yehara)

Anasibirites pacificus (Yehara)

Anasibirites pacificus katoi (Yehara)

Anasibirites sp. nov. aff. *spiniger* Diener

Wyomingites sp. nov. aff. *aplanatus* (White)

Pseudomonotis shikokuensis Yehara

Pseudomonotis cf. *iwanowi* Bittn.

時代 江原博士ハ本原上部ヘアスキン介ヲ含メル部分ヲ「ツーコセラス帯下部ノ「シュードモノチス」ヲ含メル小部ヲ「シュードモノチス帯ト稱シ「ツーコセラス帯ヲ印度ヒマラヤ山ノ「ツーコセラス」ト比較シテ本原ノ時代ヲ下部三疊系ト斷定セリ其後清水博士ハ採取セル化石及江原博士ノ化石ヲ再調シテ本層ヲ「アナシビリテス」帯ト稱シ其化石ヲ「チキール」「ヒマラヤ」「ソルトレンヂ」等ノ類似化石及近縁種ト對比シテ平均シ歐スキチック」下部三疊紀ノ上部ニ「コルムビタン」(Columbitan) 期ノモノト判定シ尚ニコルムビタン期ヨリ古期ノ化石ニ比較シ得ルモノハ「コルンビタン」期マテ殘存セルモノト想像セリ尚ホ其後清水博士ハ同地方石灰岩中ヨリ產セル *Proarcestes* aff. *haniell* Welter (S. Shimizu: Note on Two Carnic Species of Proarcestes of Shikoku, Japanese Jour. of Geol. and Geog. Vol.V III, No.3. 1931) ヲ記載セリ本化石ハ「カルニック」(上部三疊紀) ニ屬スルモノニシテ「コルムビタン」期ノモノト共ニ就長ナル地域中ニ產シ各時期ニ區劃スル

能ハス，故ニ田穂ノ三疊系ハ單ニ下部三疊系ノミニアラサル恨アリ，故ニ玆ニハ單ニ三疊系トシテ記述シ置ケリ

六、珠羅系

(一)安藝川統

本統ハ上部古生層ノ南卽チ圖幅ノ中央部ニ於テ略東西ニ亙リ帶狀ヲ成シテ發達ス，主トシテ砂岩，頁岩ノ互層ヨリ成リ放散蟲頁岩ヲ挾有セリ，本統ハ東隣ノ須崎圖幅ヨリ連亙シ上下ノ二層ニ分タル

(イ)下部層

本層ハ多數ノ放散蟲頁岩層ヲ挾メル砂岩頁岩ノ互層ナリ

砂岩　灰色或ハ暗灰色ヲ呈ス，成層理ヲ示サス塊狀ヲ成シ細粒乃至粗粒ニシテ石英及長石ヨリ成リ粘板岩ノ破片ヲ交ヘ粘土質物ヲ以テ膠結セラル，厚サ〇·三米內外ニテ頁岩ト互層セル帶縞狀ヲ現出ス，是レ本系ノ特質ナリ，而シテ普通ニハ厚サ一米乃至十米ナリトス

頁岩　灰色或ハ暗灰色ヲ呈シ時ニ黑色ナルモノアリ，成層理明ラカニシテ良ク層面ヨリ板狀ニ剝離スルモノ，成層理ナクシテ緻密塊狀ノモノ，或ハ稍柔軟ニシテ裂目多ク容易ニ小片ニ

破碎スルモノアリ，時ニ不規則形ノ泥灰岩ヲ含ム，厚サ十糎內外ニテ砂岩ト互層ヲ成シ普通ニハ一層厚サ一米乃至十米ナリ

蠻岩　暗灰色ヲ呈シ小豆大乃至胡桃實大ノ砂岩，粘板岩，硅岩，角岩等ノ礫ヲ暗灰色砂質粘土ニテ膠結シ厚サ〇·五米乃至三米ナリ

放散蟲頁岩　普通紅色或ハ紅紫色ヲ呈シ稀ニ淡綠色ヲ呈ス，本岩ニハ膠結度弛ク軟質ニシテ成層理ヲ現シ厚サ三糎內外ノ薄板狀ニ剝離スルモノト，稍硅質ニシテ緻密堅硬，層理ヲ缺キ塊狀ナルモノトアリ，共ニ微粒ノ長石，石英ヨリ成リ土狀物ニテ膠結セラレ赤鐵鑛ノ微粒ヲ含ミ放散蟲ノ形骸ヲ包藏セリ，一層ノ厚サ一米乃至五米ナリ

構造　東部高岡郡橋原村北宇和郡日吉村ニ於テハ走向東西乃至北六十度西傾斜北方六，七十度ナルモ唯橋原村下桁渡川井ニ於テ傾斜南方ニ四十度ナルハ局部ノ褶曲或ハ斷層ノ爲メナルヘシ，中央部北宇和郡日吉村，三島村，愛治村，二名村ニ於テハ區域狹小ナル帶狀ヲ成シ走向日吉村日向谷ニ於テ北六十度東，愛治村ニ於テ東西，傾斜共ニ北方五十度乃至七十度ナリ，西部吉田町附近數箇村ニ亙レルモノハ東西ノ斷層及略南北ノ斷層ニヨリ數區ノ地塊ニ分カタレ，一般ニ走向東西乃至北六十度東，傾斜北方ニ五十度乃至七十度ナルモ，斷層附近ニ於テハ或ハ走向北五十度東或ハ北四十度西等ヲ示シ傾斜北東或ハ北西方ニ五十度內外ニシテ斷層ノ爲

メニ地層擾亂セリ

本層ハ東部ニ於テ走向東西ヨリ北六十度西ニ、中部ニ於テ北六十度東ヨリ東西ニ漸次轉向シ彎曲層ヲ形成シ、西部ニ於テ走向約東西トナリ各部共ニ一般ニ北方ニ傾斜シ之ニ小向斜及小背斜ノ小褶曲ヲ伴ヘリ、而シテ西部ニ於ケル各斷層地塊モ北方傾斜ノ單斜層ヲ成セリ

(ロ) 上層部

本層ハ圖幅内ニ於テ僅カニ東部ノ小區域ニ發達シ東隣ノ須崎圖幅ニ廣域ニ發達セルモノニ連續セリ、本層ハ砂岩頁岩ヨリ成リ唯僅カ一箇處ニ於テ赤色放散蟲頁岩ヲ挾有セリ

砂岩　灰色或ハ暗灰色ヲ呈ス、細粒乃至中粒ニシテ石英、長石ヨリ成リ粘板岩ノ小破片ヲ含メルモノ多ク粘土質物ニテ膠結セラル、厚サ十糎乃至三十糎ニテ頁岩ト美麗ナル縞狀ノ互層ヲ成スモノト、厚サ一米乃至五米ニテ頁岩ト互層セルモノトアリ

頁岩　普通灰色或ハ暗灰色ヲ呈シ時ニ綠色、黑色或ハ紅色ヲ呈ス、概シテ緻密堅硬ニシテ成層理ヲ現シ板狀ニ剝離スルモ、時ニ柔軟ニシテ小片ニ破碎シ易キモノ、成層理無ク塊狀ヲ成スモノアリ、厚サハ〇・三乃至十米ナルモ薄キモノハ砂岩ト美麗ナル縞狀ノ互層ヲ成シ、一米乃至十米ニ達スルモノハ砂岩トノ互層ナルモ其厚サ不規則ナリ、紅色ヲ呈スルモノハ橋原新田間ノ道路ノ一側ニ露出シ放散蟲ノ形骸ヲ含ミ赤鐵鑛粒ト粘土質物ヨリ成ル

構造　本層ハ圖幅内ノ東部當別峠、高野附近ノ一小區域ニ發達シ、岩層ハ北東乃至東西ニ走リ、高野附近ノ北方ニ於テハ北方ニ八十度傾斜スルモ、中洞附近ニ於テハ南方ニ八十度傾斜ス、概シテ急斜セル岩層ナルヲ以テ構造ヲ明確ニ知リ難キモ略東西ニ亙レル向斜層ヲ成セルモノヽ如シ、而シテ南方ノ安藝川下部層トハ正斷層、北方ノ秩父系トハ逆斷層或ハ衝上斷層ヲ以テ相接スルモノト推定ス

(二) 四萬十統

本統ハ圖幅内ノ東南部ヲ占メ、主トシテ頁岩砂岩ノ互層ヨリ成リ之ニ角岩、凝岩、石灰岩及放散蟲頁岩ヲ伴フ

全層ノ厚サ約五千米ニ達ス

頁岩　灰色或ハ暗灰色ヲ呈シ成層理ナク塊狀ヲ呈スルモノ多キモ時ニ成層理ヲ現シ層面ニ沿ヒ板狀ニ剝離スルモノアリ、一層ノ厚サ普通一米乃至十米ニシテ厚キモノハ三十米ニ達スルコトアリ、薄キモノハ一層ノ厚サ〇・三米内外ニシテ砂岩ト縞狀ノ互層ヲ成ス

砂岩　灰色或ハ灰白色時ニ暗灰色ヲ呈ス、稍堅硬ニシテ普通細粒質ナリ、石英、長石、磁鐵鑛有色鑛物等ヨリ成ル、厚サ普通一米乃至三米ナルモ厚キモノハ二十米ニ達シ、薄キモノハ〇・三米

乃至〇五米ニテ薄キ頁岩ト美麗ナル互層ヲナセリ

角岩　灰色或ハ淡綠色ヲ呈シ硅質ニシテ緻密堅硬ナリ

一層ノ厚サ一米乃至五米ナリ

礫岩　灰色ヲ呈シ砂岩粘板岩硅岩角岩等ノ小豆大乃至胡桃實大ノ礫ヨリ成リ灰色ノ砂粒ニヨリテ膠結セラル、モノト綠色粘土質砂粒ニヨリテ膠結セラル、モノトアリ一層ノ厚サ一米乃至三米ナリ

放散蟲頁岩　紅色或ハ紅紫色ヲ呈シ成層理無ク塊狀ノモノト成層理ヲ現シ薄板狀ニ剝クルモノトアリ赤鐵鑛粒ヲ含メル粘土質物ヨリ成レルモノト細粒ノ角陵アル砂粒ヲ交フルモノトアリ概シテ放散蟲ノ形骸ヲ含ムモ時ニ全ク之ヲ發見セサルコトアリ一層ノ厚サ一米乃至五米ナリ

石灰岩　灰色ヲ呈シ緻密堅硬ニシテ細粒ノ方解石ヨリ成リ粘土質物ヲ交フ時ニ饅狀ヲ呈シ粘土質物ヲ交ヘ鳥ノ巢石灰岩ト同樣ノ化石ヲ含ムコトアリ本岩ハ頁岩中ニ扁桃狀ヲ成シテ介在シ厚サ大ナル部分ニテ一米乃至三米ナリ

構造　本統ハ日吉村父ノ川ヨリ東方北ノ川ニ亙レル斷層ヲ以テ北方ノ安藝川統下部層ニ接シ西方ハ北々東南々西ニ走レル斷層ニヨリ上部白堊系ニ接ス本統ハ圖幅內ニ於テ昭和村

大道大正村中津川ニ亙レル放散蟲頁岩及角岩ヲ挾メル砂岩頁岩層ヲ下部トシ其上ニ奥藤川、霧立山ニ發達スル砂岩頁岩層其上ニ宮成地方ニ發達セル鳥ノ巢石灰岩ヲ挾メル砂岩頁岩層アリ、

岩層ノ一般走向及傾斜ヲ述フレハ東部檮原川沿岸ニ於テ走向北六十度西乃至東西ニシテ傾斜北方ニ七十度內外中部霧立山向畑附近ニテハ走向東西ニシテ傾斜北方ニ六十度乃至八十度西部藤ノ川大畑ニ於テハ走向北四十度乃至六十度東傾斜北西方ニ四十度乃至六十度ナリ卽チ岩層ハ東ヨリ西ニ亙リ北方ニ突出セル一ツノ彎曲層ヲ成シ概シテ北西ニ傾斜セル單斜層ナリ而シテ此ノ間ニ奥藤川蛭谷ニ亙レル北東南西ノ斷層及多數ノ走向斷層發達セリ

七、鳥ノ巢・領石統

本統ハ秩父系安藝川統及上部白堊系ノ境域或ハ此等ノ岩層中ニ斷層ニヨリテ圍マレ數區ニ分レテ賦存シ頁岩砂岩礫岩ヨリ成リ所謂鳥ノ巢石灰岩ヲ伴フ岩層ナリ

頁岩　灰色或ハ綠色ヲ呈シ概シテ成層理ナク塊狀ナルモ時ニ成層理ヲ現シ板狀ニ剝離ス一般ニ稍柔軟ニシテ露頭ニテハ角稜アル小片ニ破碎シ易シ一層ノ厚サ普通一米乃至五米ナルモ時ニ二十米ニ達スルコトアリ

砂岩　灰色或ハ帶綠灰色ヲ呈シ,細粒質或ハ粗粒質ニシテ,粗粒ノモノハ屢々礫岩ニ移過セリ.本岩ハ主トシテ石英,長石ノ破片或ハ粒子ヨリ成リ磁鐵鑛,赤鐵鑛,其他有色鑛物粒ヲ混ニ,厚サ一米乃至五米ニシテ土居村菊谷上流ノ本岩中ヨリハ *Astarte* sp. ヲ採集セリ

礫岩　綠色,灰色或ハ紅色ノ硅板岩ノ小豆大乃至胡桃實大ノ礫ヨリ成レルモノト,硅岩,角岩,砂岩,粘板岩,玢岩及石灰岩ノ小豆大乃至拳大ノ礫ヨリ成レルモノトアリ,共ニ砂粒ニヨリテ膠結セラル.兩者ハ發達ノ場所及位置ヲ異ニシ,前者ハ本統ノ下部後者ハ上部ニ發達セリ.一層ノ厚サハ兩者共ニ一米乃至五米ナリ.上部ニアル礫岩中ニハ化石ヲ埋藏シ,高川村成及土居村菊谷ニ於ケル本岩中ヨリ *Trigonia kikuchiana* Yok. 及 *Trigonia pectiniformis* Yok. ノ化石型ヲ採集セリ

石灰岩　灰色或ハ暗灰色ヲ呈ス.本岩ハ緻密堅硬ニシテ成層理ナク塊狀ヲ呈シ扁桃狀ヲ成シテ頁岩中ニ介在セリ.主トシテ細粒ノ方解石ヨリ成リ粘土質ヲ交フルモ時ニ粘土質部ト石灰質部ト層狀ヲ現スコトアリ.又屢々劍狀ヲ呈スルモノモ發見セラル.本岩中ニハ化石ヲ埋藏シ,其量多キ時ハ化石ノ集合物ヲ石灰質粘土ニヨリテ膠結セルコトアリ.一層ノ厚サ一米乃至五米ナリ

化石　本統中ノ石灰岩ハ所謂鳥ノ巢石灰岩ニシテ珊瑚類石灰藻類,層孔蟲類,有孔蟲,海膽,腕足類等ノ化石ヲ含有ス

井上博士ハ二十萬分一宇和島圖幅地質說明書中ニ於テ北宇和郡愛治村大宿ノ石灰岩中ニ有孔蟲 *Textularia*, *Rotalia* 珊瑚類 *Isastraea*, *Thamnastraea*, *Latimeandra* 蘚蟲類其他ヲ產シタルヲ記載セリ,層孔蟲類ニ就テハ早坂博士ハ東宇和郡野村町附近ノ鳥ノ巢石灰岩中ヨリ *Circoporella semicalathrata* Hayasaka ヲ記載シ(I. Hayasaka: On a new Hydrozoan Fossil from the Torinosu Limestone of Japan 東北帝國大學理科報告地質學部第四卷第二號,一九一七年),矢部博士及杉山學士ハ東宇和郡魚成村櫻峠,野村町木落等ヨリ次表ニ示スカ如ク五種ヲ產スルヲ誌シ(H. Yabe and T. Sugiyama: Stromatoporoids and Related Form from the Jurassic of Japan——Japanese Jour. of Geol. Geogr. Vol. VIII, No. 1—2, 1930)又前記櫻峠及木落ヨリ *Stromatomorpha yokoyamai* Yabe et Sugiyama ヲ記載セリ(H. Yabe and T. Sugiyama; On Some Spongiomorphoids Coral form the Jurassic of Japan—東北帝國大學理科報告地質學部第十四卷第二號,〔九三一年〕)

Actinostromaria shimizui Yabe et Sugiyama ……魚成村櫻峠,野村町木落

Stromatopora crassifibra Yabe et Sugiyama ……野村木落

Stromatopora japonica Yabe ……魚成村櫻峠,下宇和村板谷峠,土居村土居古市間,高川村池野々

Stromatopora memoria-naumanni Yabe ……野村町木落,魚成村櫻峠(?)

Stromatopora memoria-naumanni var. *densis* Yabe et Sugiyama ……野村町木落

今回調査中鳥ノ巣石灰岩ヨリ採集シタル化石ハ左ノ如シ

高知縣橋原村越知面　*Caetetopsis*

越知面高野越間　*Stromatopora*, *Chaetetopsis*

成田野々間　*Stromatopora*

大越竹藪　*Chaetetopsis*

愛媛縣東宇和郡土居村南　*Cidaris*, *Ostrea* sp.

中津川　六射珊瑚

下相　*Terebratula bisuffarcinata* Zieten, *Stromatopora*

土居村古市　*Cidaris* 棘 珊瑚

高川村成　*Stromatopora*, 珊瑚

同　川津　*Chaetetopsis erinita* Neumayr, *Stromatopora* 海膽棘

愛媛縣東宇和郡魚成村古市　*Pycnoporidium lobata* n Yabe et Toyama

廣田　六射珊瑚

櫻峠　六射珊瑚

野村町木落　*Pycnoporidium*, *Cidaris*, 六射珊瑚

溪筋村鮎歸　*Stromatopora*

四郎ケ谷　*Chaetetopsis erinita* Neumayr, *Cidaris*

野村町深山　六射珊瑚

下宇和村中駄場　珊瑚

北宇和郡愛治村大宿　*Circoporella semiclathrata* Hayasaka, *Nipponophyces*?, *Stromatopora*, 珊瑚

日吉村高皿　*Circopora*, 珊瑚

富母里成間　*Circoporella semiclathrata* Hayasaka

泉村興野々　珊瑚

本統ノ砂岩及鰻岩中ヨリハ前記セルカ如ク次ノ二枚介化石ヲ發見セリ

土居村菊谷上流　*Astarte* sp.

土居村菊谷及高川村成　*Trigonia kikuchiana* Yok.

Trigonia postlifformis Yok.

尙ホ野村町伊勢井谷ニ於テハ清水博士ハ *Nilssonia*, *Cladophlebis* ヲ發見セリト云フ(昭和七年日本地質鑛産誌第七十五頁)

鳥ノ巣石灰岩ハ其化石ニヨリ一般ニ上部珠羅紀ノモノトシテ知ラレ砂岩鰻岩中ノ二枚介

ハ下部白堊紀ヲ指示スルモノトセラレ,伊勢井谷ノ植物化石ハ領石統ノモノナルヘク,因テ本統ヲ珠羅紀ヨリ白堊紀ニ跨カレル島ノ巣領石統トシタルナリ

構造　本統ハ越知面,長谷,橋原,川津,土居,野村以西ノ南北中央部ノ三帯高皿,窓峠等ノ諸區域ニ賦存ス,

各區域ノ地質構造及岩層ノ狀況ハ次ノ如シ

橋原村越知面區域ニ於ケルモノハ砂岩,頁岩,蠻岩ヨリ成リ,一般ニ走向北六十度東,傾斜北西方ニ六十度ニシテ,大田戸及田野々ニ於テハ傾斜南方ニ六十度或ハ直立シテ斷層ヲ以テ古生層ニ接セリ,本區域ノ砂岩中ニハ炭化物ヲ埋藏シ,鳥ノ巣層ノ上位ニアル領石層ヲ想起セシムルカ如キモノアリ

長谷區域ハ越知面斷層ノ南ニ在リ,本統ハ砂岩頁岩ノ互層ヨリ成リ之ニ一層乃至三層ノ石灰岩ヲ挟ム,走向ハ略東西ニシテ傾斜北方ニ六十度内外ナリ,本區域ニ現ルヽ岩層ノ厚サヲ概算スルニ約五百米アリ,田野々ノ石灰岩中ニハ鳥ノ巣統ノ化石ヲ埋藏ス

橋原區域ハ橋原ノ東ノ神在居ヨリ西方ノ高川村川津ニ亙レル地帯ニシテ此區域ノ本統ハ斷層ニヨリテ北南西ノ三部ニ分カタル

橋原附近ニ於テハ神在居竹ノ藪ヲ通シ東西ニ亙レル斷層アリテ北部ト南部トニ分カタル,

北部ニ於テハ砂岩頁岩ニ石灰岩ヲ伴ヒタル岩層發達シ,石灰岩中ニハ鳥ノ巣統ノ化石ヲ埋藏シ明カニ鳥ノ巣統即チ上部珠羅紀ニ屬ス,走向ハ略北七十度東ニシテ傾斜北方ニ六十度乃至八十度ヲ現シ單斜層ヲ構成ス,南部ニ於テハ主トシテ砂岩頁岩發達シ之ニ厚サ五米内外ノ蠻岩ヲ挟ミ,蠻岩中ニハ石灰岩礫ヲ含ム,岩層ハ一向斜,一背斜ヲ形成シ褶曲層ヲ現セリ,蠻岩中ノ石灰岩礫ニハ化石ヲ發見セサルニヨリ其石灰岩ノ時代ハ不明ナルモ含石灰岩礫蠻岩ハ鳥ノ巣統ヨリ上位ニアルカ如キ觀アリ,或ハ下部白堊紀ニ屬スル岩層ナルカ如シ,大麥附近ノ西部區域ニテハ北東ヨリ南西ニ亙レル斷層ニヨリテ前記ノ南部區域ト接シテ一區劃ヲ占メ,之ニ發達セル本統ハ鳥ノ巣石灰岩ヲ挟メル砂岩頁岩層ニシテ走向略北六十度東,傾斜北西方ニ六十度内外ニシテ單斜層ヲ形成ス

川津區域ハ東西乃至北東―南西ニ亙レル斷層ニヨリ東西ニ延長セル一區ヲ成ス,川津ニハ砂岩,頁岩,蠻岩及石灰岩ノ累層成附近ニ於テハ南ヨリ北ニ順次石灰岩ヲ挟メル砂岩頁岩層,細粒灰白色砂岩ヲ挟メル砂岩蠻岩層,石灰岩ヲ挟メル蠻岩,砂岩,頁岩ノ累層發達セリ,走向ハ略東西,傾斜北方ニ五十度乃至八十度ナルモ成及中津川ヲ通スル南境ノ斷層附近ニ於テハ垂直或ハ南方ニ八十度傾斜セリ,

石灰岩中ニハ鳥ノ巣統ノ化石ヲ含ミ,此石灰岩ヲ挟メル砂岩,頁岩,蠻岩ノ累層ハ上部珠羅紀

ヲ表シ,灰白色砂岩ヲ挟メル砂岩礫岩層ハ礫岩中ニ *Trigonia pectiliformis* Yok., *T. kikuchiana* Yok. ヲ,砂岩中ニ *Astarte* sp. ヲ含メルニヨリ下部白堊紀ヲ表スルモノナリ

川津以西ニ於テハ本統ハ三帯ヲ成シテ發達ス,中央部土居野村區域ノ一帯ハ最モ發達良好ニシテ土居附近ヨリ,魚成,野村町ノ南ヲ經テ渓筋村鮎帰迄連亙シ砂岩頁岩礫岩及石灰岩ノ累層ヨリ成ル,走向一般ニ東西,傾斜北方ニ五十度乃至八十度ニシテ單斜層ヲ成シ全岩層ノ厚サハ約五百米ナリ,本地域ノ石灰岩ハ一層乃至三層アリ,各島ノ巣統ノ化石ヲ埋藏シ伊勢井谷ニ於ケル石灰岩中ニハ二枚貝及腕足類ノ化石ヲ含ミ,又該石灰岩ノ上位ニアル砂岩礫岩ノ累層中ヨリハ領石統ノ植物化石ヲ採集セラレタリト云フ,即チ本地域ノ大部ハ島ノ巣統ナルモ伊勢井谷ニ於テハ領石統マテ發達セルカ如シ

北部ノ帯ハ板取川,嘉喜尾,四郎ケ谷ノ南ノ三小區域ニ散在セリ,板取川及嘉喜尾ニ於テハ礫岩ヲ挟メル砂岩頁岩層發達シ,走向板取川ノモノハ不明ナルモ,嘉喜尾ノモノハ略東西,傾斜北方ニ四十度乃至六十度ニシテ單斜層ナリ,四郎ケ谷ノ南ノモノハ古生層内ノ断層溝中ニ東西ニ長キ帯狀ノ地域ヲ占メ,石灰岩ヲ挟メル砂岩頁岩層ニシテ,走向略東西,傾斜北方ニ七十度内外ナルモ断層附近ニ於ケル傾斜ハ南方八十度内外ニシテ岩層稍亂ル,如シ,石灰岩中ニハ島ノ巣統ノ化石ヲ埋藏シ,上部珠羅紀ニ屬スルモノヽ如シ,南部ノ帯ニ屬スルモノハ古市附近安家谷,大宿,深山中駄場ノ四小區域ニアリ,古市附近ノモノハ川津區域ヨリ分岐シテ古生層ノ一地壘ヲ隔テヽ其南ニ南西ニ發達シ,砂岩頁岩層ヨリ成リ石灰岩ヲ挟ム,走向略東西,傾斜北方ニ六十度内外ナリ,安家谷ノモノハ断層ヲ以テ古市附近ノモノト絶タルヽモ其南西ニ連ナリ砂岩頁岩層ヨリ成ル,之ニ化石ヲ産セサリシモ岩石ハ他ノ區域ノ島ノ巣領石統ニ類似シ走向北六十度東,傾斜北西方ニ七十度内外ナリ,是ヨリ南方ノ本統ハ愛治村大宿,深山及下字和村中駄場ニ斷續シ共ニ上部古生層(秩父系)ノ断層溝中ニ小區域ニ發達セル砂岩頁岩層ニシテ,之ニ大宿ニ於テハ含化石石灰岩二層深山ニ於テハ暗灰色鰯狀石灰岩一層,中駄場ニ於テハ珊瑚石灰岩一層ヲ伴ヘリ,走向ハ各地ニ於テ略東西ナルモ断層附近ニ於テハ亂雜トナリ,傾斜概シテ北方ニ六十度内外ナルモ南方ニ斜下セル部分モアリ,各地ノ地層ハ石灰岩中ノ化石ヨリ推定スルニ大部分ハ島ノ巣統即チ上部珠羅紀ニ屬スルモノナルヘシ

本統ハ此他ニ御在所山南側高皿附近及三間村窓峠附近ニ發達ス,高皿區域ニ於ケルモノハ砂岩及頁岩ヨリ成リ,石灰岩ヲ挟ミ,北東ヨリ南西ニ亙レル断層溝中ニアリ,走向北東—南西ニシテ傾斜北西方ナリ,本區域ノ石灰岩中ニハ島ノ巣統ノ化石ヲ埋藏セリ,窓峠區域ニ於ケル本統ハ主トシテ礫岩頁岩ヨリ成リ砂岩及石灰岩ヲ挟ミ,北東—南西ニ亙レル二平行断層,南北ニ亙レル二断層ニ圍マレタル断層地塊ヲ成シテ發達セリ,走向ハ略東西ニシテ傾斜南ニ三十度

乃至六十度ヲ示ス、本區域ノ石灰岩中ニハ *Cidaris* ノ刺ヲ含ミ鳥ノ巢統ヲ表スカ如シ

八、上部白堊系

本系ハ圖幅ノ南部ニ發達シ砂岩頁岩、砂質頁岩及蠻岩ヨリ成リ岩層ハ斷層ニヨリ數區域ニ分ル、モ、大體泉ケ森ヨリ槇ノ山ニ亙レル西部ノ砂岩頁岩蠻岩層ト、成藤ヲ中心トシテ東部ニ發達セル含化石砂質頁岩ヲ挾ミ蠻岩、砂岩ヲ伴ヘル頁岩層トニ分タル、前者中ニハ鬼ケ城山宇和島圖幅地內ノ花崗岩ノ貫入ノ爲メ硬化シ或ハ變質シテ「ホルンフェルス」トナレルモノアリ

砂岩　灰色、灰白色帶綠灰色ヲ呈シ普通層理ナク塊狀ヲナシ時ニ層理ヲ示ス、中粒乃至粗粒ニシテ、石英、長石、雲母、磁鐵鑛ヨリ成リ一層ノ厚サ一米乃至十米ナリ

頁岩　灰色、暗灰色或ハ綠色ヲ呈シ、層理無ク塊狀ニシテ玉葱狀ノ裂理アリ、又小片ニ破碎シ易シ、時ニ層理ヲ現シ板狀ニ剝離スルモノアリ、厚サ普通一米乃至五米ナルモ厚キモノハ三十米ニ達スルコトアリ

砂質頁岩　暗灰色ヲ呈シ、層理ナク塊狀ニシテ膠結稍弛ク、玉葱狀或ハ不規則ナル裂隙アリテ裂性著シ、厚サ三米乃至十五米ナリ、本岩中ニハ化石ヲ堙藏セリ

蠻岩　暗灰色或ハ灰色ヲ呈ス、小豆大乃至拳大、時ニ頭大ノ砂岩、頁岩、角岩、粘板岩、斑岩等ノ礫ヲ暗灰色或ハ灰色粘土交リノ砂粒ニヨリテ膠結セルモノナリ、時ニ綠色、灰色等ノ角岩礫ヲ含ミ雜色ヲ呈スルコトアリ、厚サハ一米乃至五米ナリ

構造　西部ナル泉ケ森ヨリ槇ノ山ニ亙レル本系ハ走向略東西、傾斜北方ニ四十度乃至八十度ニシテ單斜層ヲ成シ、厚サ千五百米ニ達ス、吉波、增田附近ニ於テハ走向北七十度西、傾斜北東方五十度內外、又河鰭附近ノモノハ稍頁岩ニ富ミ變質セルコト少ナシ

東部ナル成藤附近ノ本系ハ、石神峠ヨリ澤松ニ亙レル斷層、淸水ヨリ國遠ニ亙リ略南北ニ走レル斷層及國遠ヨリ略東北東ニ廣見ニ向テ走レル斷層ニヨリテ大內、成藤、西野々、油谷ノ四區域ニ分カタル、大內區ニ於テハ走向南北ヨリ北四十度西ニシテ向斜層ヲ成シ、成藤區ニ於テハ黑川ニテ走向北二十度西、傾斜東方ニ七十度、中間（ナカアヒダ）ニテ走向北二十度東、傾斜西方ニ八十度、御淵ニテ走向北六十度東、傾斜南東方六十度、成藤ニテ走向北二十度西、傾斜東方ニ二十度ヲ示シ、一背斜及一向斜層ヲ形成ス、西野々區ニ於テハ走向北二十度東乃至北四十度東、傾斜北西方ニ二十度乃至四十度ニシテ單斜層ナリ、又油谷區ニ於テハ走向北四十度東、傾斜北西方ニ四十度乃至五十度ニシテ單斜層ナリ、成藤區ノ本系ハ概シテ下部ハ砂岩、頁岩層、上部ハ頁岩、砂質頁岩層ニシテ厚サ五百米內外ト概測ス

化石及時代　本系ノ砂質頁岩中ニハ屢々「イノセラムス」ノ化石ヲ堙藏シ又「アムモン」介及海

膳ヲモ産セリ.江原博士ハ大内及清詰ニテ下部ノ擬ノ山礫岩中ヨリ *Inoceramus* cf. *regularis* D' Orb. ヲ成藤ニテ中部ノ砂岩中ヨリ「イノセラムス」等ノ二枚介ヲ産スルヲ誌セリ(Jap. Journ. Geol. Geogr. Vol. III, No.1, 1924)

更ニ今回發見シタル化石産地及其他ノ化石名次ノ如シ

二名村大内及黒川　*Inoceramus tawajimaensis* Yehara
　　Inoceramus cf. *regularis* d'Orb.

同村中間　*Inoceramus* cf. *regularis* d'Orb.

好藤村成藤　*Inoceramus* cf. *regularis* d'Orb.
　　Inoceramus tawajimaensis Yehara
　　Gaudryceras sp., Echinoid

同村成藤上組奥　*Inoceramus* sp., Echinoid

愛治村滑水下組　*Inoceramus* cf. *regularis* d'Orb.

三島村炭見ノ對岸　*Inoceramus* sp.

泉村岩谷ノ對岸　*Inoceramus* sp.

右ニ掲ケタルカ如ク所産化石ハ天草下島及豊後犬飼附近ノ白堊系産ノモノト類似シ本岩層ハ上部白堊系ニ屬スルモノナリ

九、更新統

本統ハ砂礫及粘土ヨリ成リ,愛媛縣土居村古市,魚成村野村町地方ニ於ケルモノハ,河岸ニ堆段堆積層ヲ成シテ發達シ,主トシテ砂礫ヨリ成リ,稀ニ粘土ヲ交ヘ厚サ一米乃至二十米ナリ,日吉村高野子ニ發達セル本統ハ主トシテ粘土ヨリ成リ其上位ニ薄キ砂礫アリ全部ノ厚サハ十五米内外ナリ

十、現世統

本統ハ沖積層ニシテ砂礫及粘土ヨリ成リ海岸及河流ノ沿岸ニ發達セリ

十一、花崗斑岩

本岩ハ泉ケ森ノ南西側ニ於テ上部白堊系ヲ貫通シテ岩脈ヲ成ス.南隣宇和島圖幅地内ノ高月山附近ニ廣ク露出スル黒雲母花崗岩ノ周縁部ニ於ケル一岩肢ト認ムヘキモノニシテ彼ノ黒雲母花崗岩ニ比シ稍斑狀ヲ呈ス

岩石　灰色ヲ帶ヒ斑狀ヲ呈シ殆ント完晶質石基ハ細粒結晶質ナリ

主成分―正長石、斜長石、石英　副成分―白雲母、鳳信子鑛、磁鐵鑛、鱗灰石、次生綠簾石

斑晶ヲ成スモノハ主ニ正長石及斜長石ナリ、正長石ハ大サ一粍乃至五粍ノ短柱狀自形結晶ニシテ大ナルモノハ斑晶ヲ成ス、概ネ「カールスバド」雙晶ヲ成シ又陶土化作用ヲ受ケ高陵土及絹雲母ニ分解セルモノ多シ、斜長石ハ概シテ中性長石或ハ是ヨリ酸性ノモノニシテ大サ一粍內外ノ半自形結晶ニシテ「アルバイト」或ハ「カールスバド」雙晶ヲ成ス、石英ハ一粍乃至三粍ノ粒狀晶ヲ成シテ長石間ヲ塡充ス、白雲母ハ鱗片狀、鳳信子鑛ハ短柱狀、磁鐵鑛ハ粒狀或ハ八面體、鱗灰石ハ細柱狀、綠簾石ハ柱狀又ハ粒狀ニシテ何レモ大サ一粍以下ナリ

十二、石英斑岩

本岩ハ北宇和郡高光村及三間村地內泉ケ森ノ北麓ニ上部白堊系ヲ貫キ岩脈ヲナス

岩石　灰色ニシテ斑狀ヲ呈シ、石基ハ細粒結晶質ナリ

主成分―石英、正長石　副成分―雲母、斜長石、鳳信子鑛、鱗灰石、磁鐵鑛

石英ハ兩錐狀或ハ粒狀、正長石ハ自形ノ柱狀或ハ半自形ヲ呈シ、大サ五粍內外ニシテ斑晶ヲナス雲母ニハ黑雲母及白雲母アリテ共ニ鱗片狀ヲ呈ス、隨伴鑛物タル磁鐵鑛及鳳信子鑛ハ細

粒狀鱗灰石ハ柱狀ナリ

十三、斑糲岩

本岩ハ秩父系ヲ貫キ大小ノ岩床ヲ成シテ露出セリ、其最モ大ナルハ東宇和郡釜川附近ノモノニシテ東ハ土居村吉野澤ヨリ西ハ野村町手都合迄約十粁ニ亙リ秩父系ノミナラス一部ハ鳥ノ巢層ヲモ貫通セリ

右ノ釜川附近ノ斑糲岩々床及土居村寺野及男地（オンヂ）ノ斑糲岩ニハ共ノ一部ニ輝石ノ外角閃石ニ富ミ、斜長石モ曹灰長石ノ外ニ中性長石ヲ交フル部分アリテ一見閃綠岩ニ近似セルモノアリ然ルニ其一方ニ於テハ本岩中不規則ニ、或ハ概シテ周緣部ニハ往々蛇紋岩ヲ伴隨スルノミナラス橋原村松谷ニテ古生層ヲ貫ケルモノハ一部蛇紋岩ニ變質セリ

岩石　綠色ヲ呈シ中粒完晶質ナリ

主成分―輝石、曹灰長石　副成分―磁鐵鑛、鱗灰石、「チタン」鐵鑛、角閃石、綠泥石、綠簾石、方解石

曹灰長石ハ大サ一粍乃至五粍ニシテ柱狀又ハ半自形ヲ成ス、「アルバイト」式雙晶ヲ示シ、分解シテ方解石、絹雲母ノ集合ニ變セル部分アリ、輝石ハ淡紫色ヲ帶ヒタル「チタン」輝石ニ屬シ、大サ一乃至三粍ノ柱狀結晶ニシテ長石ノ間隙ニ點在シ或ハ充塡セリ、一部ハ分解シテ綠泥石、綠簾

石角閃石等ノ集合物トナレリ、角閃石ハ長柱狀結晶ノ放射狀集合體又ハ單晶ヲナス、綠簾石ハ細粒、綠泥石ハ毛狀、粒狀或ハ旋毛狀ヲ呈ス、磁鐵鑛ハ小ナル粒狀ノ結晶ニシテ「チタン」鐵鑛ハ卓狀ノ結晶ヲナシ燐灰石ハ小柱狀ノ結晶ナリ

十四、蛇紋岩

本岩ハ斑糲岩ト隨伴シテ其中ニ或ハ其周緣部ニ現出スルモノト、斑糲岩ト同シク單獨ニ秩父系ヲ貫キ岩床或ハ岩脈ヲナスモノトアリ、上浮穴郡浮穴村東宇和郡惣川村、高岡郡檮原村井桑、永野等ニ現出スルモノハ後者ニ屬シ喜多郡村島、東宇和郡釜川、魚成村成穗ノモノハ前者ニ屬ス、又土居村男地及寺野、檮原村松谷ノ斑糲岩ニモ本岩ヲ伴フ

岩石　綠色濃綠色等ヲ呈シ綠泥石、蛇紋石、磁鐵鑛「チタン」鐵鑛等ヨリ成リ其集合狀態ハ旋毛狀ヲ呈ス、右ノ鑛物ノ外ニ綠簾石、格魯謨鐵鑛ヲ混スルコトアリ

十五、輝綠岩

本岩ハ愛媛縣喜多郡大谷村白石同村廣常、上浮穴郡柳谷村中久保及東宇和郡魚成村成穗橋並ニ高知縣高岡郡檮原村六丁及越知面大田戶ニ於テ何レモ秩父系ヲ貫通シテ岩脈ヲ成シ或

ハ岩床狀ヲナシテ現出ス

此外愛媛縣喜多郡菅田村小倉、下村島ニ本岩トシテ暗色セルモノハ共一部ニ斑糲岩ノ部分アルモ久万圖幅トノ連絡上本岩ニ包括シ置キタリ

岩石　綠色或ハ暗綠色ヲ呈シ廣常ノモノハ緻密、成穗橋ノモノハ稍粗粒ナルモ、他ノモノハ中粒結晶質ニシテ鏡下ニハ輝綠岩構造ヲ呈ス

主成分―曹灰長石、輝石、　副成分―角閃石、磁鐵鑛、　次生鑛物―綠泥石、綠簾石、方解石、沸石

曹灰長石ハ〇五乃至四粍ノ短冊形ヲナシ放射狀ニ配列シ或ハ不規則ニ集簇シ、各晶ハ「アルバイト」雙晶或ハ稀ニ「カールスバド」雙晶ヲナス、輝石ハ長石ノ間隙ニ半自形柱狀或ハ粒狀ヲナシテ介在シ共大サ微小ナルモノヨリ二粍ニ達スルモノアリ、角閃石ハ輝石ヨリ變質セルモノニシテ、綠泥石及綠簾石ハ輝石及細粒ノ長石ヨリ由來セシカ如ク粒狀ヲナシ集簇セリ、方解石ハ長石間ヲ充塡シ沸石ハ晶洞ヲナシテ其中ニ細粒狀ノ結晶ヲナシ又ハ放射狀ヲナス、磁鐵鑛ハ粒狀或ハ八面體ノ粒子トシテ含マル

高岡郡檮原村六丁ニ露白セル本岩ハ秩父系中ニ幅三米內外ノ岩脈ヲナス、同村越知面ノ北ニ秩父系ヲ貫通セル岩脈ハ共ニ前記ノモノト稍其岩質ヲ異ニシテ著シク酸性ナリ、卽チ石英ヲ伴ヒ、中性斜長石ノ外ニ正長石、有色鑛物トシテ角閃石ヲ含メリ、斜長石及正長石ハ半自形柱

狀又ハ粒狀ヲ呈シ大サ二粍乃至四粍ニシテ「カールスバド」或ハ「アルバイト」雙晶ヲナシ著シク陶土化セリ、角閃石ハ多ク分解シテ綠泥石及綠簾石ニ變セリ、卽チ本岩ハ閃綠玢岩ニ近キモノナリトス

十六、石英粗面岩

本岩ハ高知縣幡多郡十川村戸川谷ニ於テ並ニ同村ヨリ追和谷、昭和村大畑ニ亙リテ岩脈ヲナシテ四萬十統中ニ貫入シ愛媛縣北宇和郡日吉村葛川奥、同郡三間村土居中、泉ケ森ノ北麓及高光村大畑ニ於テハ上部白堊系ヲ貫キ岩脈ヲ成ス

岩石　灰白色ヲ呈シ風化セル面ハ酸化鐵ノ浸染セルニヨリテ虎斑狀ヲ呈セリ、石理細密ニシテ時ニ斑狀ナリ

斑晶―正長石、石英

正長石ハ卓狀ヲナシ陶土化セルモノ多ク、陶土ト絹雲母トニ變セリ、石英ハ兩錐形ノ結晶ニシテ其大サ一粍內外ナリ、石基ハ石英及長石ノ微晶ヨリ成リ、硅長質構造ヲ呈シ絹雲母ノ細鱗片及磁鐵鑛ヲ混フ

第二章　應用地質

一、銅　鑛

本圖幅地ノ秩父系中ニハ含銅硫化鐵鑛床ヲ埋藏セル所アリ、其主ナルモノ次ノ如シ

東向（ひがしむき）鑛山　高知縣高岡郡檮原村東向ノ奥ニ在リ、池邊春光ノ採掘鑛區ニ屬シ年々小規模ニ銅鑛ヲ採掘シ左表ノ如ク銅精鑛ヲ産セルモ巡回當時ハ休山セリ

昭和四年	一三・〇噸
五年	一二・〇
六年	八・六
七年	一・〇・五
八年	二二八・五

鑛床ハ秩父系ノ粘板岩中ニ層狀ニ胚胎セラルヽ、鑛脈ニシテ、粘板岩ハ綠泥化作用ヲ受ケ綠色ヲ呈セリ、坑外ニ殘存セル鑛石ニヨリテ察スルニ鑛石ハ綠色粘板岩中ニ黃銅鑛及黃鐵鑛ノ

鑛染セルモノニシテ鑛脈ハ幅約六糎ノモノアリタリ

惠美須鑛山　愛媛縣東宇和郡遊子川村野井川ニアリテ試掘中ナリ此地ノ地質ハ秩父系ノ角岩及粘板岩ニシテ東西ニ走リ北方ニ七十度傾斜セリ鑛床ハ灰色粘板岩中ニ幅三糎内外上下約〇五米内外ノ鑛體ヲナス鑛石ハ細密ナル黃鐵鑛及黃銅鑛ノ凝集セルモノニシテ塊狀ヲナス試掘坑ハ掘進僅ニ數米ニシテ前記ノ鑛脈ノ他ニ見ルヘキモノナシ

龍德鑛山　愛媛縣東宇和郡惣川村龍德ノ奥ニアリ試掘中ニ屬シ秩父系粘板岩中ニ僅量ノ鑛石ヲ見タルノミ

二、格魯謨鐵鑛

圖幅地內ノ蛇紋岩中ニ格魯謨鐵鑛ヲ藏セルコトアリテ採掘セラレタルコトアリ其主ナル地方ハ高知縣高岡郡檮原村高階野永野井桑神野山愛媛縣東宇和郡魚成村刃河內喜多郡菅田村小倉等ニシテ之等各地共現在全ク採掘セラレス採掘跡ヲ巡檢セルニ各鑛床ハ鑛巢或ハ網狀ヲ成シテ蛇紋岩中ニ胚胎セラレタルモノ、如ク之ヲ目的ニ處々ニ不規則ニ開坑採掘シタルナリ其鑛石ハ帶紫黑色ヲ呈シ蛇紋岩中ニ主トシテ格魯謨鐵鑛ノ鑛染セルモノナリ

三、水銀鑛

藤ノ川水銀鑛山　愛媛縣北宇和郡日吉村藤ノ川ニアリ其開坑セラレタルハ明治ノ初年ニシテ一時「アンチモニー」鑛山トシテ「アンチモニー」鑛ヲ採掘セシコトアリ後富母里鑛山ト稱シ時々水銀鑛ヲ採掘シタリ巡回當時ハ休山中ニシテ坑內ニ入坑シ得サリキ鑛床ハ四萬十統ノ頁岩層中ニ通スル含水銀鑛石英脈ナルモノヽ如ク坑外ニ堆積セル鑛石ヨリ推察スルニ辰砂ノ細粒ノ石英中ニ網狀ニ含マレ或ハ鑛染セルモノナリ坑外ニ堆積セル鑛石ノ良質部ヲ本所分析係ニ於テ試ニ分析セルニ其結果含水銀量ハ百分中二九八四アリタリ

四、滿俺鑛

本圖幅地內ノ秩父系ノ角岩ニハ處々滿俺鑛ヲ含有シ其富鑛部ハ大正七八年ノ交ニ盛ンニ採掘セラレタリ其主ナル地方ハ東宇和郡下宇和村宇和町野村町土居村北宇和郡三島村ナリトス

是等各地ノ採掘跡ヲ見ルニ開掘セル部分ハ多クハ殆ント皆地表近キ處ノミニシテ僅ニ地

下十數米ニ達スルモノ、ミナリ之ヲ以テ見ルニ是等ハ概ネ酸化帶内ノ黑色二酸化滿俺鑛ノ富鑛部ノミヲ採掘セルモノナラン

五、甑土

更新統及現世統ノ粘土ハ處々ニ於テ磚瓦用粘土トシテ利用セラル、愛媛縣日吉村鑓山地方ノ更新統ノ粘土ハ礫層中ニ挾マレ約二米ノ厚サヲ有シ、褐色及帶青灰色ノ部分アリテ之ヲ採リテ瓦燒キノ原料トシテ利用セラル、又、現世統ノ粘土ハ三間川沿岸野村町附近、卯之町、田ノ筋附近ニ於テ盛ンニ瓦燒用粘土トシテ利用セラル、モ地方ノ需要ニ供スルノミナリ

六、石灰岩

秩父系及島ノ巢統ノ石灰岩ハ生石灰燒製原料トシテ利用セラル、アリ、採石中ノ主ナルモノハ北宇和郡玉津村東宇和郡魚成村、渓筋村、土居村、野村町、喜多郡藏川村、上浮穴郡浮穴村、高知縣高岡郡檮原村大藏谷等ナリ、生石灰ハ主トシテ稻田ニ撒布施肥セラル、モノナルヲ以テ、採石ノ時期モ自ラ農村ノ閑暇ノ時即チ晩冬初春ノ候ニシテ之ヲ焦製シテ石灰トナス、其產額ハ

一ケ年ノ使用量ヲ見込ミテ採石スルヲ普通トス

七、石材

秩父系、安藝川統、四萬十統、上部白堊系等各地層ノ石灰岩及砂岩ハ石垣石或ハ墓石トシテ諸地方ニ於テ利用セラル、モ、四萬十統及上部白堊系ノ砂岩ハ加工容易ナルヲ以テ特ニ良ク利用セラレ、北宇和郡三間村、成妙村、愛治村二名村、好藤村等ニ於テ採石セラレ地方ノ需要ヲ充セリ

八、鑛泉

圖幅地内ノ愛媛縣東宇和郡宇和川村小藪、同郡高川村池野々及同郡中筋村高瀨ニ於テアルカリ性鑛泉湧出シ各地ニ於テ之ヲ浴湯ニ利用セリ

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EXPLANATORY TEXT

OF THE

GEOLOGICAL MAP OF JAPAN

Scale 1 : 75,000

UNOMACHI

Zone 33 Col. XIX

Sheet 249

By

TATSUO SUZUKI

(Written in 1934)

(Abstract)

GEOLOGY

Mikabu Series (**Pre-Carboniferous**) consists of epidote-chlorite-schist and graphite-schist, and is found in a small area at the northwestern corner of the sheet map area, extending to the Kuma sheet on the north. The strata strike N 60° E and dip to northwest at angles ranging from 40° to 60° and show monoclinal structure.

Kume Series (**Pre-Carboniferous**) is composed mainly of green or gray phyllite intercalating quartzite, sandstone, limestone and schalstein. It is developed mainly near the northern corner of the sheet map area lying on the southern side of the Mikabu Series from which it is separated by a fault running from northeast to southwest.

The extension of the series is divided into three zones by two fault-lines running nearly parallel to each other from northeast to southwest. In the northern zone, it is composed mainly of green phyllite rich in chloritoid substances, and intercalates thin layers of quartzite. The strata strike N 60° E and dip to north at angles varying from 40° to 60°. In the middle zone it is built up dominantly of gray phyllite with some sandstone and quartzite, striking N 40° to 60° E, and dipping about 60° toward north. The strata are folded near the fault line. In the southern zone where it consists of gray phyllite with intercalated crystalline limestone, red and green schalstein and gray or white quartzite, the strata strike from east to west dipping toward north at angles varying from 40° to 60°, showing a monoclinal structure. No fossil being found in the Kume Series, its age is not determined. But, from its lithological characters, it seems to be older than the Upper Palaeozoic Chichibu System. The areal boundary between these two formations is marked by a fault running from northeast to southwest.

Chichibu System (Permo-Carboniferous) consists mainly of gray to black or green slate and fine-grained gray or dark gray sandstone. White to gray or reddish tinged hornstone with occasional radiolarian remains, green schalstein rich in chloritic matter or epidote, red or purple schalstein containing haematite, white or gray fine crystalline limestone are intercalated in the System. The limestone is locally fossiliferous. Permo-Carboniferous

Fusulinid foraminifera such as *Fusulina*, *Schwagerina*, *Neoschwagerina*, *Verbeekina*, *Neofusulinella* and some corals such as *Lonsdaleia*, etc. were detected from the limestone. This system occupies the northern half of the sheet map area, and is cut by many faults. Three remarkable strike-faults, Ochimen, Takano and Hokezu, running nearly from east to west seem to be reverse or thrust faults. The general strike of the strata is from east to west and dip-angles vary from 30° to 80° to north. The thickness of the whole system can not easily be measured, on account of frequent occurrences of several faults. The southern boundary is well defined by faults which separate it from the Jurassic Akigawa Series and the Jura-Cretaceous Torinosu-Ryoseki Series.

Kokuzōsan Series may be, as already mentioned in the explanatory text of the Susaki sheet, divided into two beds; the upper and the lower. A foraminiferal fossil *Schwagerina* has been found in the limestone in the lower bed at Miyanoura in Takagawa-mura, Tosa. On this account, the lower bed is here included in the Chichibu System, only the upper bed being mapped as the Kokuzōsan Series. The series lies on the Chichibu System as its upward continuous strata and consists of sandstone, hornstone and slate. It strikes nearly from east to west and dips to north at about 70°. The thickness of this monoclinal strata is measured to be 700 m.

Triassic Series consists of gray sandstone, dark gray shale, chert and limestone, and is found in a narrow belt,

elongated from east to west, at Taho, being bounded on the north and south by two subparallel faults between the Chichibu System and the Torinosu Series. The general strike is about from east to west and the dip to north at about 60°, forming monoclinal strata. The thickness of the series is estimated at about 300 m. This series was referred as the *Meekoceras* Bed by Dr. Yehara, a number of *Ammonites* and *Pseudomonotis* belonging to the Lower Triassic Skytic epoch being described from it. Later Dr. S. Shimizu described also the above fossils and some additional species (as listed on p. 12 of the Japanese text), most of which are of the Columbitan Stage of Skytic, only one Ammonites *Proarcestes* aff. *haniela* Welter being of the Carnic.

Akigawa Series is a continuation of the same found in the neighbouring sheet of Susaki on the east. Two beds, the upper and the lower, are recognized.

The **Lower Beds** consist chiefly of sandstone and shale, intercalating radiolarian shale and conglomerate. The sandstone is light gray or gray in colour and fine to coarse grained. The shale is generally hard, compact and massive, but some part of it show clearly stratification and exfoliate on exposure. The radiolarian shale is red or purple in colour, showing stratification and easily disintegrates into slabs on exposure. It is composed chiefly of clayey matter mixed with brown dust of iron oxide and radiolarian remains. The conglomerate is made up of pebbles of slate, hornstone, quartzite and others of pea or

nut size cemented by fine sand and clay. The Lower beds are found well developed in the southern part of the sheet, occupying a wide zonal area extending from east to west. In the east, the strata have a curved strike, changing from N 40° W to E-W and next to N 60° E, as observed from west to east, and dip to north at angles between 50° and 80°. In the west, however, the strata generally strike almost E-W and dip to north at angles ranging from 50° to 80°.

The **Upper Beds** occur in a small area around Takanoko and are composed of sandstone and shale with one layer of red shale. The sandstone and shale are seen in places in fine alternation. Between the Upper and Lower beds is found a fault trending from east to west. The strike of the Upper beds is about N 70° E or E-W and the dip is 60° to 80° toward north.

Shimanto Series is composed commonly of gray shale and medium grained sandstone associated with conglomerate, radiolarian shale, hornstone and limestone. The series may be divided into three beds, namely: the lower, sandstone and shale with radiolarian shale and hornstone; the middle, sandstone and shale; the upper, sandstone and shale with fossiliferous limestone. The total thickness of the whole series is about 5,000 metres. The strata strike, at Fujinokawa, N 50° E, dipping to NW at 40° to 60°; at Mt. Kiritate, from East to West, dipping to N at about 70°; and along the middle course of the river Yusuwara, the series run N 60° W, dipping to NW at 60° to 80°. The limestone at Miyanaro embeds some coral-

line fossils quite similar to those of the Torinosu Series, so that the upper, sandstone and shale beds may be identical with the Torinosu Series or the Upper Jurassic, and the middle and lower beds may belong to the older Jurassic.

Torinosu-Ryoseki Series (Upper Jurassic-Lower Cretaceous) is built up of shale, sandstone, conglomerate and limestone. The conglomerate found in the lower part of the series contains pebbles of green and red cherts and that in the upper part, cobbles of sandstone, shale, gray chert and porphyrite. The former is sometimes fossiliferous, *Trigonia kikuchiana* Yok. and *T. pocilliformis* Yok. having been found at Takagawamura. The limestone, gray to dark gray in colour, occurs in the shale at two or three horizons, and is prolific in fossils such as reef-building corals, *Stromatopora, Chaetetopsis,* calcareous algae, *Cidaris* and some brachiopoda. The series is found as if squeezed, between the two masses of the Palaeozoic Chichibu strata or between the Palaeozoic and the Jurassic Akigawa series, thus forming roughly three belts arranged along the three prominent faults, Ochimen, Takano and Hokezu, mentioned before. The general strike is from east to west and the dip angles vary from 40° to 80° to north, rarely to south. The thickness is measured at about 500 metres. The fossils of *Trigonia* from the conglomerate at Takagawamura are of the Lower Cretaceous, but other fossils from the Torinosu limestone layers indicate that the greater part of the series belong to the Upper Jurassic.

Upper Cretaceous consists of the sandstone and shale

zone intercalated with conglomerate in the lower part and the shale zone in the upper. The lower zone is found lying around Mts. Makinoyama and Izumigamori in the western part of the area occupied by the series, striking from east to west and dipping northward at about 50°. These monoclinal strata attain about 1,500 metres in thickness. The upper zone lies to the east of the former, and is built up chiefly of shale and sandy shale with intercalated minor layers of medium-grained, gray or greenish sandstone and conglomerate. The sandy shale is gray and fossiliferous. *Inoceramus* cfr. *regularis* d'Orb., *I. uwajimensis* Yehara and a few echinoids are found at many places. The strata around Narifuji are broken into many blocks by transverse and longitudinal faults. The series changes its strike from N 20° W to N 40° E, forming two synclines and one anticline. The total thickness of the Upper Cretaceous is estimated at about 500 metres.

Pleistocene covers river-terraces near Nomura-machi and Uwonashi, and is composed of clay, sand and gravel, forming horizontal layers and attaining 20 metres in maximum thickness.

Recent consisting of sand, gravel and clay, forms alluvial plains along rivers and sea coast.

Granite-Porphyry occurs as dikes intruded into the Upper Cretaceous shale and sandstone zone near Izumigamori. These dikes may be apophyses branched off from the Biotite-granite mass exposed on Mt. Takatsuki in the neighbouring Uwajima sheet. The rock is gray in colour

and granular in texture, but it partly shows rather porphyritic texture. The chief components are quartz, orthoclase, biotite and muscovite, accompanying magnetite, zircon, apatite, epidote and kaoline. Porphyritically contained in the rock are some orthoclase crystals, having prismatic habit and in albite or carlsbad twinning.

Quartz-Porphyry occurs as dikes intruded into the Upper Cretaceous Series at the northern flank of Mt. Izumigamori. It is porphyritic in texture, and is composed chiefly of quartz and orthoclase, containing zircon, magnetite, apatite, biotite as accessory minerals.

Gabbro is found intruding into the pre-Carboniferous Kume Series, the Upper Palaeozoic Chichibu System as well as the Torinosu Series as huge sheets or large masses at Ogura and Murashima in the north, and also at Ongawauchi and Kamagawa in the central part of the sheet. Small dikes of this rock are also found at Onji and Matsudani. Commonly it is granular in texture and green in colour, but sometimes gray or dark green. Titan-augite and labradorite are chief components of the rock and chlorite, epidote, magnetite, ilmenite and calcite are accessory minerals. It is partially altered into a green serpentinized rock, rich in chlorite, epidote and serpentine. In places, especially in the periphery of the masses, it is associated with serpentine as seen at Ogura and Ongawauchi.

Serpentine occurs intruding into the Upper Palaeozoic Chichibu System as sheets or dikes, often associated

with schalstein. The rock is green or dark green in colour and is composed chiefly of fibrous serpentine and chloritoid substance mixed with magnetite, chromite and ilmenite grains.

Diabase is found intruding into the Chichibu system in the form of dikes or sheets. Some are fine in texture, while others are mostly medium to coarse crystalline. The rock is green in colour, and is composed chiefly of labradorite and augite, showing diabasic structure and being associated with epidote, zeolite, magnetite, chromite and calcite. The dikes exposed at Ōtado near Ochimen and Rokucho in Yusuwaramura contain abundant hornblende and andesine, besides orthoclase and quartz which are seen in interstial spaces of andesine, so that it may be an acidic type of the diabase to be correctly called as Diorite-Porphyrite.

Liparite occurs intruding into the Shimanto Series at Ōhata and into the Upper Cretaceous at Izumigamori in the form of dikes. It is gray in colour, being often altered brown by weathering. It contains quartz and orthoclase as phenocrysts in a felsitic groundmass.

ECONOMIC GEOLOGY

Copper Ore is found as cupriferous pyrite deposits. In the Upper Palaeozoic rocks at Kochimuki in the Kōchi Prefecture, and Ebisu and Ryutoku in the Ehime Prefecture. These deposits are of the bedded vein type of small scale, the ore consisting of minute grains of pyrite

disseminated into the slate or other country rocks. They are, however, under prospecting only and are not productive at present.

Chrome Ore was once mined at Isō and Nagano in the Kōchi Prefecture, Ogura and Ongawauchi in the Ehime Prefecture and other places, but none of them is worked now. The deposits are pockets formed by concentration of chrome iron ore in the serpentine.

Mercury Ore was worked until some months ago at Fujinokawa, Hiyoshi in the Ehime Prefecture. The deposit is a quartz vein impregnated with cinnabar, traversing the Shimanto Series.

Manganese Ore which is the quartzite of the Chichibu System locally impregnated with manganese ore, was prospected or mined many years ago at Shimo-Uwa, Uwamachi and Nomura in the Higashi-Uwa District, and Uonashi and Doi in the Kita-Uwa District.

Potter's Clay obtained from the Recent and Pleistocene sediments is utilized for manufacturing roofing tiles to meet local demands.

Lime is produced at several places by burning limestones of the Chichibu system and Torinosu Series as for the fertilizer for rice-fields.

Building Stones are got from sandstones and limestones in the Palaeozoic and Mesozoic Systems, especially sandstone of the Upper Cretaceous which is very easy to be carved for any desired form.

Mineral Springs which are alkaline in nature gush out at Takase, Ōyabu, Ikenono in Higashi-Uwa, Ehime Prefecture. They are used for baths on heating.