

國立中央研究院

地質研究所
集刊

第壹号

湖北陽新大冶鄂城之地質矿产

叶良輔 赵国宾

地質研究所印行

十七年十一月

湖 北 陽 新 大 冶 鄂 城 之 地 質 礦 產

GEOLOGY AND MINERAL DEPOSITS OF YANG SIN, TA YEH, AND O CHENG, SOUTHEASTERN HUPEH

L. F. YIH & K. P. CHAO

(Summary)

Below Ling Hsiang, a district in eastern Hunan, the Yangtze River turns northeastward and then deflects toward the southeast at Hankow, thus making a great arc. In the eastern part of the region encircled on the north by this arc are situated the districts, Yang Sin, Ta Yeh, and O Cheng, which field was studied by the authors in the Spring of 1928. This report covers the general geology and mineral resources of the area.

Various rock formations of different resistance to erosion form the south wall of the great river valley. However, a great part of its course is generally in accordance with the strike of the rock strata except the red sandstone supposed to be of late Tertiary age, which fill up the valley and its deposition was taken place after the river-making.¹

Folded mountains play a dominant part in the region mapped. Near the main drainage the land is one of low relief. In other words, the mountain-mass has been advancedly maturely eroded. To the south it has been only maturely dissected. Where granite or diorite intrusion is present the country is almost as a rule changed to a broad valley furnishing a good site for cultivation. Another outstanding feature of the area is the abundance of lakes with arms extending for some distance into the mountains. They are nothing, but drowned river valleys.

Stratigraphically the following formations have been observed:—

I. Ordovician limestone:—This limestone was reported to occur in the southwestern corner of Yang Sin,² but the region has not been visited by the authors.

II. Silurian Sandstone & Shale:—As in other localities in the Yangtze Valley this formation is composed of a thick succession of white quartzose sandstone above and a series of variegated shales and sandstone below making a total thickness of more than 350 m. *Spirifer hsiehi*, *Dalmanella* sp., *Encrinurus* sp., etc. were found near Fu Shieh Kou in Yang Sin and at Hsi Shan west of O Cheng city.

¹ L. F. Yih: *Geol. Struct. & Physiographic Hist. of the Yangtze Valley*. Bull. Geol. Survey. China, No. 7, p. 98.

² C. Y. Hsieh: *Strat. of S.E. Hupeh*. Bull. Geol. Soc. China, Vol. III, p. 92, 1924.

III. Permian & Carboniferous limestone:—This lies disconformably above the Silurian and can be further distinguished into three divisions:— (a) Dark cherty limestone, each bed has a thickness of 2 feet or more. Crinoids, Corals, and Fusulinella are abundant. Its topmost part carries in many instances a thin and discontinuous seam of anthracite. This limestone is recently known to be of upper Carboniferous and lower Permian age.³ (b) Coal-bearing shales and limestone having a total thickness of about 100 m. In its lower part occurs a cherty-limestone about 10 m. thick. Both above and below this limestone is a seam of anthracite 0.3-2 m. thick. (c) Light gray, thin bedded limestone; each is only about a few centimetres thick. Its highest members are thick bedded or massive. The total thickness is not less than 500 m. Though no fossils were found in the next two divisions, they certainly belong to the Permian age, as we can know from the general stratigraphy of the Yangtze region.

In other parts of Hupeh and its neighbouring province, these three divisions can be regularly traced throughout the whole area. Now in this region the middle coal-bearing series usually fails to occur, which makes it hardly possible to differentiate the upper and lower limestone especially in disturbed areas, and when it occurs, the exposure is so limited that it is impossible to represent it in the general geological map. For this reason, the three divisions are coloured as one group in the accompanying map.

IV. Jurassic beds:—This formation has yellowish gray sandstone and shale with bituminous coal of unknown thickness as its upper part; white, coarse or quartzose sandstone and conglomerate as the middle; and soft purplish sandstone as the lower member. The total exposure varies from 100 to 200 m. in thickness. The direct contact of this formation with the older rocks are not observed except in one locality where it seems to be disconformably underlain by the Permian thin bedded limestone. Jurassic plants have been found.

V. Cretaceous lava formation:—A series of buff-coloured rhyolite and tuff not less than 150 m. thick occurs unconformably above the Jurassic beds.⁴ In the lower Yangtze valley, Ex. Kiangsu, a similar lava formation succeeds unconformably the Chung Shan series.⁵ In the latter were recently found some *Cyrena* of upper Jurassic age.⁶ Therefore it is

³ Y. T. Chao: *Brachiopod Fauna of Chihhsia limestone*. Bull. Geol. Soc. China, Vol. VI, pp. 83-120, 1927.

⁴ For detail see L. F. Yih: *Ling Hsiang Iron Deposits*. Mem. No. 5, 1928. Inst. Geol., Nat. Research Inst. China.

⁵ C. C. Liu: *Geol. & Min. Resources of Kiangsu*. Mem. Ser. A. No. 4. Geol. Surv. China.

⁶ C. Y. Hsieh: *Geol. of Chun Shan, Nanking* (in Chinese). Science, Shanghai, Vol. XIII, p. 474, 1928.

probably not inappropriate to assign this formation to lower Cretaceous age.

VI. Tertiary sandstone and Pliocene clay:—Unconformable to all older rocks is a red, compact conglomerate and sandstone. In some localities there are intercalated some basalt flows. Again unconformably above all older formations is the red clay and gravel. The former is probably of late Miocene age while the latter is of Pliocene.⁷ Commonly both occur together and the sandstone is usually buried underneath the clay and visible only in gullies and along hill slopes. Hence no attempt was made to differentiate the two formations in the geological map.

Occurrences of igneous rocks are fairly numerous.⁸ There are two principal intrusions; one is the granite body of Yang Sin, which is connected with the copper ore, and the other is the diorite of O Cheng and Ta Yeh, which is in contact with the well known iron deposit.

All the rock strata older than the red sandstone are conformable in structure. Their strike varies between E.-W. and S.E.-N.W. where igneous intrusion is located, the intruded formations strike more or less according to the margin of the former and commonly have steep inclination. Anticlines, synclines, and strike faults were repeatedly seen (see sections in pl. II). The remarkable feature is that the rock strata are in many cases overturned toward north though there has been found no definite overthrust.

Copper ores occur in several localities either in veins or in contact metamorphic zones. All are related with granite or granite porphyries. Only a limited section of the contact type situated in the west of Yang Sin is promising. Bornite is the chief ore mineral.

The iron ore of Ta Yeh has been comprehensively described by many geologists. No further contribution can be made except one word can be added that in Yeh Chi Ping big blocks of diorite partly converted to chlorite and deeply decomposed are enclosed in the ore mass and veins and stringers of the ore extend irregularly into the diorite. At Tieh Men Kan decomposed diorite is very extensive near the contact of the ore body, which decomposition may be due to the hydrothermal alteration caused by the introduction of the ore. All these facts may prove that the ore entered the region somewhat later than the diorite.

The iron deposit of Ling Hsiang, O Cheng, was studied a little more in detail this time. It seems to be formed by replacing the Cretaceous lava flow.⁹

⁷ L. F. Yih: *Geol. Struct. Yangtze Valley*. Loc. Cit.

⁸ For detailed description see T. L. Ho: *Igneous Rocks of Southeastern Hupeh*. Mem. No. 2, 1928. Inst. Geol., Nat. Research Inst. China.

⁹ For detail see L. F. Yih: *Ling Hsiang Iron Deposits*. Loc. Cit.

Manganese ore of comparatively good quantity occurs in the north of Yang Sin city. It is contained in Hematite; the latter is a replacement deposit in the Permian cherty limestone. Psilomalane occurs in cavities. It is no doubt derived by decomposing and concentrating from the poor hematite

The Permian coal-series distributes widely; but the promising part is found only in a limited extent near Shieh Huei Yao where communication and mining conditions are all favorable. The probable reserve is about 10,000,000 to 20,000,000 tons.

Not much is known of the Jurassic coal. It is situated in low depressions near the lakes and the region may be easily drowned during high water season.

L. F. Y.

目 錄

	頁 數
緒 言	1
地 理	2
地 層	5
火 成 岩	9
構 造	13
礦 產	18
附述湖北省東南各礦廠之現狀	24
附圖三幅	
英文目錄	39
英文節錄	i-iv

湖北陽新大冶鄂城之地質礦產

葉良輔 趙國賓

緒言

湖北建設廳長石衡菁先生蒞任之初，即注意於鄂東礦產，向本所提議派員研究。四月，本所派葉良輔趙國賓赴陽新大冶鄂城，李捷舒文博余新都赴嘉魚蒲圻咸寧等縣。其研究範圍大致如次：一，詳測蒲圻侏羅紀煤田。二，考察陽新大冶之銅礦礦床。三，研究鄂城靈鄉鐵礦。四，就經過各地，填繪地質分佈及構造圖，并採集標本以備研究。四月十日良輔國賓等由滬抵漢。十三日即在陽新富池口開始實地工作，由是至陽新縣城，北達銀山之錳鐵礦地。再轉向西，至白沙鋪四周之牛頭山，韓家山，赤馬山，歐陽山，七峯山等銅礦區域。又深入南鄉，經三溪口，新塘鋪，龍港，折向東，經贛鄂交界之下馬關至木石港。復回縣城，北行，逾九頂山，至炭山灣附近，西折抵大冶縣。初在大冶西南之龍角山，天台山一帶，調查銅礦；既至得道灣，鐵山鋪等處，參觀鐵礦；乃往石灰窰，陽武山，研究產煤區域。然後抵鄂城縣，先觀察城西雷山之鐵礦，與城南數十里間之地層狀況；於是西經蘆蓆，金牛鎮，研究靈鄉鐵礦與地質；乃折回金牛，取道武長鐵道，回至武漢。計在野外實地調查，共約五十日，行程幾二千里。

茲因陽新大冶鄂城三縣地質圖已經編成，先作地質概說，隨圖發表。他如銅礦鐵礦岩石等之研究，一俟完竣，隨時再印。

查鄂東地質，于民國十二年，曾經北平地質調查所之謝家榮劉季辰兩先生調查一次，發刊臨時簡報二冊，并已經編成四十萬分之一之地質圖；惜以事冗，總報告尙未編就，圖亦未曾付印。良輔等此次出發，時間迫促，未得先借閱已成材料，藉資參考，甚爲憾事。謝劉兩先生首先在陽新縣發現志留紀之三葉蟲，解

決江南最普遍的一種地層之時代，厥功甚偉。近由翁文灝先生寄來簡報二冊，參考後，乃知彼此研究之結果，雖各有詳略異同，要皆為鄂東地質之參考資料，此固在讀者之善為合而用之矣。

調查時以湖北陸軍測量局十萬分之一之地形圖為根據；該圖不甚準確，而所繪地形尤多似是而非之處，例如石灰窖至漳源口一帶之山脈，又鄂城西部之土岡及大冶龍角山天台山等處是也。作者祇能依據原圖，填繪地質，未能擅自更改，蓋三角基本已錯，改亦無益。總之此次調查之結果，大致如次：(1)鄂省東南部地層每每倒轉褶曲，現象頗為顯著，但無確實可指之逆掩斷層，可知褶曲之時，地殼上層之側壓力，南段略強于北段。(2)陽新大冶間之銅礦，為我國東南久著之礦產，其實祇赤馬山一段，較有希望。(3)鄂城靈鄉之鐵礦，由鐵質溶液，交換凝灰岩而成，儲量並不豐富。(4)鄂省東南，銅鐵往往共生，但銅質係與附近之火成岩，同時上昇，積聚于接觸帶而成，鐵則後于火成岩而至，惟鐵質中亦稍夾銅礦而已。自經此次觀察以後，作者更堅信長江流域之鐵礦大多為溶液交換而成也。由是可言，銅鐵共生之處，設其成因相同，則鐵富銅不多，銅多鐵不富。調查時大冶礦廠之周子建徐象數盛芷皋諸先生又富源公司之劉協理高礦師均竭誠引導。又湖北建設廳委員熊說嚴先生襄助調查，及本所何作霖丘捷舒文博諸同事相助研究之處頗多，特誌之以表謝忱。

地 理

三縣位置 長江自湖南臨湘以下，由南曲向東北而經武漢；由是曲向東南，至富池口，漸趨于東。故長江經流於鄂東者，成半弧形。本組調查所經之三縣，位臨長江半弧之東部；鄂城縣位居最北，且濱江岸，面積狹長，南北約一百五十里。其東南為大冶縣，距江約三十里，南北長約一百里。復東南為陽新縣，距江約六十里，縣區東西延長二百里，北與鄂城大冶交界。

長江河谷 長江河谷與南岸地層之關係,自西北達東南大致如次: 鄂城江濱爲二疊紀石灰岩與志留紀砂岩,傾向大致爲北三十度東,斜角四十五度,故河道與地層走向,大致平行。城東廿里許之燕磯,爲第三紀紅砂岩所成,因掘起于沖積平原之中,故山勢雖不高,而遠矚卽見,從汽船中遙望,大致似無甚傾斜,行近黃石港,則爲侏羅紀砂岩層,侵蝕面呈黃色,豈卽黃石之名所從出歟。岩層傾向北七十度東,斜角廿五度至四十五度。長江至此,幾成南北,大致似按地層走向而變易其方向者。在石灰窖桐梓堡一帶,二疊紀灰岩走向爲北七十度西與南七十度東,河道與地層走向亦復大致相符。抵黃鰲口,河道與地層走向幾成直交。至富池口,志留紀層傾向南十五度西,河道大致仍與地層平行。綜而觀之,河道與地層走向平行者爲多。惟在黃鰲口一段,特然出軌,情形複雜,是否在靳春附近尙有河道變遷之跡,抑有他故歟,尙待詳細調查。惟就平行之處而言,水線與岩層亦非絕對相平行者。蓋長江之產生與地層折曲,初有關連,因歷史攸遠,變遷繁複,現在之河道與地層關係不能如初時之簡單,著者早已言之矣(見北平地質調查所地質彙報第七期揚子江巫山以下之地質)。

山脈 據地形之高下與支脈之離合,三縣之山,可分三支:(一)大冶鄂城間之山脈,西至寶安,東迄漳源,北達鄂城。西野山牛角山飛雲洞寶岩以及大冶鐵礦諸山均屬之。中以白雉山爲最高,高出江面約七百公尺,餘者大都高約三五百公尺。(二)大冶陽新間之山脈,東至黃鰲口,西達金牛鎮。天台山龍角山七峯山大箕山赤馬山父子山黃姑山犀牛山等屬之。高自三百至七百公尺。(三)陽新之南以迄贛邊之山,高自二百公尺至七百公尺。分歧較多,以致層障疊翠,造成偉峨之勢。三組之山復于相當地點互相銜接,合而爲東西間之大屏障。

就構造而分類,則有爲折曲山(Folded mountain)者,有爲斷層山(Block mountain)者,又有爲侵入體與火山岩流經過侵蝕風

化而破碎所成者。合而計之，全區山脈之走向與山坡之緩急，因折曲而生成者爲多。故可統稱爲折曲山脈。其詳細構造，將於構造章中言之。

按山脈自造成以後，因侵蝕風化而日剝月削，減少其體積，終而至于成爲侵蝕平面 (Peneplane)，其中可分爲幼年壯年老年諸期，是爲育化程度 (Stage of Development)。侵蝕之多寡，隨山脈之高低，岩石之軟硬，距離主要水系之遠近，與造山時期之先後而各異。鄂東之山論其育化程度，可分數區而言之：(一)志留紀層與二疊紀所成之山脈，已屆壯年期；蓋山脈與河谷，各居空間之半者頗多，但接近長江者則遠過壯年期矣，例如漳源湖四周之山是也。志留紀層之下半部以頁岩居多，質地較弱，易于破壞，故山勢往往平緩。志留紀層上部之砂岩與二疊紀灰岩，硬度似相仿，均有留成高峯者。(二)侵入岩與火成岩所在之區，則育化程度頗深，除大冶鐵山一帶，他如鄂城縣之南鄉與陽新西鄉之龍山鎮(即白沙鋪一帶)花崗岩體已化爲寬谷，殘餘者，幾若培壘，小箕山即顯著之例也。據作者研究皖南地質之經驗，凡花崗岩閃長岩之區域，往往育化程度極深，惟侵入體之偉大者則不在此例；或長江流域雨量之多有以助之歟。(三)新生代之紅土與紅砂岩，質地軟弱，易于剝削，然育化程度各處不一；七峯山南麓之紅土層，三面環山，距江甚遠，故遺留者多，但已豆剖瓜分，丘崗起伏，極阻交通，與壯年之育化狀態頗近似矣。陽新城附近，漳源湖沿岸，以及鄂城沿江之地，紅土與砂岩之孤山，出露于沖積地者，老年育化之殘物也。

水系 北緯三十度以南，除長江外，有顯著之河道。河之最長者名富水，源出通山縣之西南，曲折甚多，而大致自西東行，至陽新南鄉之排市，倏折而北；至港口，復蜿蜒而東，經富池口入大江，在陽新縣境者，長幾貳百里，富水至港口，有三溪河來會。所謂三溪河者，即在三溪口會合而成之水也；一自大頭凹東行至三溪口，一自蔡山頭東南行者，名閔口水，一自劉仁堡東南流，出花

猶樹至三溪口者。以上諸水復各納南北兩山之溪澗以成複雜之水系。合成之後，全系似成樹枝狀 (Dendritic drainage)，似不與褶曲構造相關者。細察之，上舉四水均大致與地層走向相平行，而爲後成河 (Subsequent river)；或流于兩種地層之交界處，或流于志留紀層之下半部，又或流于走向斷層所經之地。富水困于羣山之內，其能出崇山，入大江者，幸在排市附近，地層忽起變化，志留紀層倏折而北，導之而出東西橫貫之大山也。所稱四水，均已造成泛濫平原 (Flood plain)，育化程度，已達壯年。河道雖窄，河床不深。富水較大，便於舟楫，然自陽新市以上，已不利航行矣。

湖沼 河流以外，水區之顯著者厥爲湖沼。陽新縣城附近之網湖，明湖，南湖等，悉已變爲沼地。至五六月間，江水暴漲時則仍有水。大冶縣城鄰近之金湖，漳源湖，黃石港西之華家湖，保安附近之保安湖，鄂城西鄉之梁子湖等，有水甚淺，大小無定，可注意者，即各湖沿岸，尙有支湖，深入山間，成犬牙相錯之狀。是皆曩昔大江被淹，江水內侵，河道覆沒于洪水，侵蝕泛濫之明證 (參見著者所作揚子江巫山以下之地質史載北京地質彙報第七期)。

地 層

鄂省之地層系統，已經謝劉二君及李四光趙亞曾諸先生詳細研究 (參考北平地質調查所出版品)，故本屆調查，祇注意于地層之類別及其分佈，于各地層內部之詳細層序，則未加研究。

本屆所見地層最古者屬志留紀，而謝劉兩君於十二年之行，在陽新大冶市之北山，發見奧陶紀之寶塔石腕足類等化石。其地適爲輔等所未經，甚爲可惜，又據謝劉二君之簡報所載，辛潭北山，亦爲此層，則有誤焉；蓋自三溪經紫荊山而至辛潭，輔等步行一日，調查尙周，其間之灰岩悉爲二疊紀層。圖中大冶附近之奧陶紀層，係根據謝劉二君之報告所加入者，其起迄之處，尙待更正。茲將所見地層，分述于後。

一. 志留紀層

本層上部例以砂岩爲主,每層厚輒在六公寸以上,色白粒細,質堅,風化面呈棕黃色。下半部爲黃色薄頁岩,白色薄層細砂岩,及灰綠色板岩所組成。全系各層性質及厚度,隨地而異,惟大致則相類似。茲就富士南大嶺所見者列舉其詳,以概其餘。自下而上:(1)爲灰綠色薄層頁岩,露于江邊者,厚五六十公尺。因其質弱,頗爲褶曲,故在江邊之褶曲狀態倍形複雜。(2)黃綠色薄片頁岩,厚約四十公尺。(3)含雲母之細粒砂岩,內部白色,表面風化成灰黃色,每層厚約十公分,共厚約八公尺。(4)薄片頁岩,黃色,風化甚深,內含三葉蟲(*Encrinurus* sp.)及腕足類(*Spirifer hsiehi*, *Dalmanella* sp.)等化石之殘跡,厚一百二十公尺。(5)砂質頁岩及頁岩狀砂岩,色淺藍,每層厚約三公寸,共厚四十公尺。(6)堅實厚層細粒白色砂岩,厚五十公尺。全系厚度總計約三百二十公尺,實在厚度當超過此數。本層厚度極難計算,蓋其下半部之頁岩易于反覆折曲,每使露頭特別寬厚。時代屬志留紀(參見 Grabau:— Stratigraphy of China Pt. 1. pp. 438-439) 鄂城西山亦爲此岩所成,於其下半部之頂層頁岩中,亦獲得三葉蟲之殘片(*Encrinurus rex* Grabau)少許。

二. 二疊紀層

本層可分爲三部:

(1) 燧石灰岩 直接位于志留紀層之上,層次整合,色深灰,每層厚輒在六公寸以上,含燧石核與晶片頗富,盛產海百合,珊瑚類,紡錘蟲等化石,厚約五百公尺。本層頂部,每夾無烟煤之晶片,厚薄不一。本層下部屬上石炭紀,上部屬下二疊紀(參考趙亞曾著棲霞山灰岩,載中國地質會誌六卷二期)。

(2) 含煤層 繼續于石灰岩者爲黑色耐火泥,頁岩,燧石等。中夾無烟煤一層。次爲紡錘蟲石灰岩,每層二英尺餘,共約厚十公

尺,其上又爲頁岩與耐火泥,亦含煤層。總計該含煤層厚約一百公尺。因其中夾含化石石灰岩十公尺,故全部又可分上下兩部。據本地採礦經驗,上下部各夾無烟煤一層,厚自三公寸至二公尺,隨地而異。在石灰窑桐梓堡一帶,煤層之最厚者達七公尺云。

(3) 薄層石灰岩 繼續于含煤層者,初有淺灰色灰質頁岩,每層厚祇數公分。然後由頁岩而改爲頁岩狀之灰岩,與薄層石灰岩。至頂部則爲厚層灰色石灰岩。總厚不下五百公尺。

皖南一帶,二疊紀層亦照例可分爲三部,因其中含煤層隨其上下之石灰岩而出露,並無變換,故在地質圖中可按例繪入。今鄂東含煤層,出沒無定,上下兩大部之灰岩,因構造上每多變換,實地界線殊難劃定,且含煤層露頭往往甚狹,故所刊地質圖中,1, 2, 3 三層并繪成一組,不加區別,本期調查,在二疊紀含煤層中,雖未曾獲得化石,但比較長江流域地層系統,參以調查者之經驗,其時代當無疑問。

三. 侏羅紀層

本層上部爲灰黃色之砂岩與頁岩,時夾烟煤,煤之厚度不明;中部爲硅質砂岩或粗砂岩,色灰白,間或參夾礫石,礫多則爲礫岩;下部爲紫紅色軟質砂岩。全厚自百公尺許至二百公尺。本層中部之硅質砂岩,頗類志留紀層之上半部,幸有下部紫紅色砂岩,藉資區別,三縣境內,本層露頭極少;大致有下列各層: (1) 大冶西鄉,西野山之南,細山祠一帶;按其地位及傾向,似在二疊紀薄層灰岩之上,然兩者之間有爲山谷,故未見接觸帶。在細山祠之小窰附近,拾得中生代之化石數種,中以 *Zamites* 爲多。 (2) 大冶黃石港一帶亦有本層露頭,其在沿江者,屬於本層中部與上部。 (3) 鄂城縣南門外以迄長嶺街王家鋪一帶,時有本層之孤山。 (4) 鄂城極南鄉,羅橋與紀家涼亭及靈鄉鐵礦區域中之雞子山下部南至柯家灣一帶,亦有本層露頭;其地岩石外貌,與他處微有不同,然仍以砂岩,頁岩爲主,頁岩中亦有植物化石

遺跡;因其覆於火山岩之下,中間不相整合,故其時代以屬諸侏羅紀爲宜。(5)大冶東部,道士袱南之石磊山有本層露頭,與二疊紀層之交界處有走向斷層。(6)陽新縣東北蝦蟆湖旁之分水嶺,亭子山,朱家山等之含煤層似亦屬侏羅紀,其與炭山灣二疊紀層之關係,因著者未到其地,不能詳言。

四. 白堊紀層

鄂城縣西南,王家鋪起以至金牛鎮,其間爲火山岩區域。該岩作豬肝色,有流紋所成之層理。斑晶爲肉紅色與白色之長石及烟石英。及至靈鄉鐵礦區,始知該區域向東延長甚廣。在雞子山與黑山之流紋岩,顯然覆於侏羅紀層之上(參見靈鄉鐵礦附圖第二版第一圖)似成不整合之關係。惟雞子山之火成岩,顏色較淺而已。東至石壁雲山,則爲文象斑岩矣。該火山岩之時代雖未能定,而參觀長江流域之地質史,或屬白堊紀也。(參見葉良輔謝家榮著揚子江流域巫山以下之地質史載北平地質彙報第七號六十九頁)。

五. 第三紀層

三縣境內屬於第三紀之地層有二種:(1)紅砂岩與礫岩,(2)紅土。兩者往往同處一地,所附地質圖縮尺既小,露頭不大,故并而繪之。

1. 紅砂岩 接近山麓之處往往有紫紅色砂岩,不整合的覆于就近岩層之上。內中往往夾礫石,石礫以灰石爲多。圓度大小不一,大者直經尺許,排列亦無規則,圓頭向上,尖端向下者有之;時或礫石稀少,則雜夾於紅砂岩中。在陽新縣北,銀山南坡者,灰岩石礫密結成厚層達數十公尺,往往容易誤爲二疊紀灰岩層中之一部份。該岩層經過斷層及褶曲。露于陽新城南者,砂岩中內夾玄武岩層。

2. 紅土 不整合于紅砂岩及其他各地層者有紅土,露頭較砂岩爲廣。

六. 冲積層

冲積土 散佈于湖邊河岸者頗廣,沿長江者,層次明晰,土質肥沃。

火 成 岩

三縣間所產火成岩,不下十餘種。其結構成分,悉經本所何君作霖,詳為研究,另印專刊,不復鉅述,茲就各岩體之產狀以及相互之關係,逐一討論之而已。

1. 龍山鎮花崗岩體 陽新西鄉六十里之白沙鋪(又名龍山鎮)四周,悉為火成岩(參見附圖第一版,第二版剖面圖[七],第三版第一圖)。侵蝕甚深,惟沿大山之麓,猶有新鮮岩石留存。綜合各地所採標本,計得左列諸種:

1. 牛頭山 角閃花崗岩
2. 牛頭山 變態輝石花崗岩
3. 李家山 鹼性花崗岩
4. 赤馬山 花崗岩
5. 歐陽山東南之馬鞍山 角閃花崗岩

可知該岩體為花崗岩質之岩漿所造成。牛頭山之變態輝石花崗岩包含肉紅色石榴石,寬約二公分;與角閃花崗岩相鄰,并與石灰岩接近。蓋岩漿侵入之際,灰岩必經溶解。其時酸化鈣流入岩漿,乃生柘榴石。同時引起火成岩中礦物內容之改組,故角閃石換為輝石矣。

岩體四周與水成層接觸處,幾成垂直面,除東北部一段特別伸長外,大致作圓形,故該岩體之形狀似為岩盤(Laccolith)之一種。查牛頭山與歐陽山附近之花崗岩,其綠色礦物微呈平行排列,此因岩漿沿接觸面受壓迫,形狀狹長之礦物如角閃者,遂發生平行排列,非後來動力變質之結果也。

該花崗岩本爲發生接觸銅礦之母岩,故其中亦含黃銅礦;惟黃銅礦與角閃石共生,故在顯微鏡下視之,銅礦之分佈亦隨之而成帶狀。

與花崗岩接觸之石灰岩變爲大理岩。與火成岩緊接處時或產生柘榴石,與硅灰石 (Wollastonite) 等變質礦物。

2. 大冶鄂城間之閃長岩體 大冶鄂城之交境間有大塊火成岩,岩體之南與二疊紀灰岩接觸之區,即爲我國著名之大冶鐵礦。東自光山起,經野雞坪,大石門,得道灣,獅子山,象鼻山,龍洞,紗帽翅,以迄鐵門坎,鐵礦露頭雖斷續不定,而火成岩綿延未絕,光山之東約十里爲下陸車站,站之西北約里餘亦稍有鐵礦。再火成岩體之北部,屬於鄂城者,在銀山稍有鏡面赤鐵礦,綜合所得標本有下列諸岩石:

下陸鐵山	石英閃長岩
野雞坪	片理石英閃長岩
紗帽翅	石英閃長岩
紗帽翅	片麻閃長岩
鐵門坎	石英閃長斑岩(肉紅色)
鐵門坎	石英閃長斑岩(白色)
排山	花崗岩
銀山頭	文像花崗斑岩

前據良輔研究我國各處鐵礦附近之閃長岩,見龍洞有花崗閃長斑岩, (Grano-diorite porphyrite) 與正長岩之夾石英者 (Quartz-bearing Hornblende Syenite) (中國地質學會誌第四卷第一百十一頁)又據王恆升君之研究云,野雞坪與獅子山之間有石英閃長岩與 Nordmarkite (與角閃花崗岩類似) (中國地質學會會誌第五卷第一六二頁)。

就實地觀察,岩石外貌各處時呈變遷,但考其形跡,不過爲岩汁分異之現象,非岩漿先後侵入之證也。茲將各處標本合而觀之,可知該岩體終以石英閃長岩爲主,已無疑義。