

## RING PHEASANT.

BY A. G. PHILL, M. D.

*PHASIANUS TORQUATUS*, (Grml). Common name: Chinese or Mongolian Pheasant.

Habitat: Western United States, Willamette Valley and southward into California.

Description—Male, total length 34 to 40 inches. Length of tail, 15 inches to 24 inches. Bill dark,  $1\frac{3}{8}$  inches long. Iris yellow. Crown, greyish green, with a white stripe extending over each eye. Around the eyes is found a large red patch of hair feathers.

Neck: Changeable green and purple, following which is a circular band of pure white, extending around the neck, and from this it receives its name.

The breast and points of the shoulders are a changeable, fire red and purplish blue, the border of the feathers being tipped with blue. Following in the median line is a narrow strip of blue feathers, which gradually emerge into black, as we approach the under tail coverts, which are greyish brown.

The tail consists of 16 feathers, the outer ones being shortest and gradually becoming longer, up to 15 or 24 inches, the two centre feathers being longest. The under coloring is greyish black; the upper, brown, with light gray and black, and brown bars.

Upper tail coverts, Irish green, bordered with old gold and tinged with bright green.

Under wing, grayish white. Body light yellow, and end of feathers tipped with blue.

The female has none of the bright markings of the male, and is about two-thirds the size of the male, of a uniform mottled pale yellow, with slight shades of brown, black and gray variously intermixed.

The above description, although deficient in many respects, will, I hope, convey some idea of the beauty of this species. The description is taken from an adult male and female in my collection.

This bird was imported from China by O. N. Denny some eight years ago. Six pair were let loose on Petterson Butte, about four miles from this place (Sodaville, Ore.), and the climatical conditions and country being favorable and being protected by a strict law for six years, they have multiplied rapidly, and now are one of our most common game birds. In fact they multiplied so rapidly that long before the six years' protection had ceased, the farmers complained bitterly that the birds were a serious damage to their grain and gardens, and many birds were killed, but in this I think they were mistaken, for in my examination of many stomachs, at all seasons of the year, I found but very little grain as their food, but many wild seeds, bugs, grasshoppers, etc.

I think that the farmers have realized this, also, to some extent, as nearly all have now posted trespass notices for their protection.

The birds are not as abundant as two years ago, as many were slaughtered by pot hunters for the Portland and San Francisco markets.

The bird is an easy wing shot, but has many devices to deceive the sportsman. I have known them to lie so close that in passing within four feet I did not discover the bird, and the bird will not fly until seen by you, and then it is off like a flash, making a great noise and cackling. They are very swift of foot; it requires a good dog to catch one that has been winged.

The breeding habits are somewhat peculiar. The female deposits her first complement of eggs about April 10 to 15. As soon as the young leave the nest they are taken in charge by the male, and the hen proceeds to lay a second complement of eggs, which in each case is generally ten to fifteen eggs. As soon as hatched the male also

takes these in charge, and the female deposits a third sitting, which is generally about eight eggs. When these are out of the shell, one can see the entire band of three broods and male and female together. Two broods are always raised, and in many cases three. Only a few days ago I saw a brood not over ten days old. They nest upon the ground, which is generally a mere hollow, lined with leaves, under some small bush or in a clump of grass and in an open field.

Oat stubble field is a favorite resort, also fern ridges.

In captivity the birds do well and even breed, but are never domesticated, for as soon as let out they at once fly away and do not return.

The bird seems to be fearless, coming into the barnyard and feeding with the fowls.

During the spring the males crow similar to our fowls. This is during the mating season. Their love antics are queer and grotesque.

The males strut around the females, with wings drooped and tail expanded and elevated, all the while uttering a low guttural sound. This performance is kept up for hours at a time.

During snow storms and frosty weather, many birds are caught here, as in roosting over night the long tails of the males freeze fast in the snow, and they are unable to get up, and one can walk up and pick them up.

I hope that the bird will, in time, be introduced into other parts of the United States and flourish, and thus give to our country one of the most beautiful game birds known.

## THE BENDIGO GOLDFIELD.

BY T. S. HALL, M. A., CASTLEMAINE, AUSTRALIA.

THE first portion of a report by Mr. E. J. Dunn, on the Bendigo Goldfield, has just been issued by the Victorian Department of Mines and is full of interesting matter, put both clearly and concisely. The rocks of the field were long ago referred by Prof. Sir F. McCoy to the same horizon as the Lower Landeilo rocks of Britain. The auriferous quartz reefs show a very peculiar structure. In most cases they occur as lenticular masses, arching over the anticlinal axes. North and south, in the direction of strike, they extend in some cases for miles, while in the direction of the dip they thin out rapidly, rarely extending for 300 feet. Mining operations show a series of the "saddle-reefs," as they are termed, one below the other. In the Lazarus mine, for instance, in sinking 2,200 feet, no less than twenty-four of these "reefs" were encountered. It is evident, that during the process of rock-folding, which has produced an average dip of 65°, cavities were produced between the beds into which the quartz segregated. It is, of course, a well-known fact that the axis of an anticline is rarely a horizontal line, but undulates more or less vertically in the direction of its bearing, but till Mr. Dunn's report, based on careful survey, appeared, the full bearing of this fact on our auriferous rocks was overlooked. This "pitch" of the anticline in Bendigo rarely exceeds 30°, but a case is quoted where it was as high as 60°. As the "saddle-reefs" lie between the bedding planes the "pitch" had, of course, been recognized by the miners, who appropriated for it, most unfortunately, the geological term "dip." As a consequence of this pitch, the deepest rocks are brought to the surface in the central portion of the area, and are the most highly auriferous. Surrounding this area is a larger one, in which the reefs do not yield gold so freely. Surrounding this second area is a third area, consisting of the highest rocks of the district and in which gold has not been found in payable quantities. The extent of the central area is about ten square miles.

No attempt has as yet been made to work out the graptolite zones in these rocks, but it seems probable, considering the enormous thickness of the rocks, that such zones will be found. The most plentiful graptolite of the central area is *Tetragraptus fruticosus*. Besides this form there are two other species of *Dedymograptus*, *Tetragraptus quadribachiatus*, *T. bryonoides*, *Dichograptus octobachiatus*, *Loganograptus Loganii*, *Goniograptus Thureauii*, *Phyllograptus typus*, *Thamnograptus typus*, and some forms apparently referable to *Dendrograptus*. All these species, it will be remembered, occur in the Quebec group of rocks. A crustacean of common occurrence is *Lingulocaris M'Coyi* (R. Etheridge jun.). This is the same as the oft-quoted *Hymenocaris Salteri*, a manuscript name of Professor M'Coy's. Two species of *Protospongia* occur, but are rare.

The extension of the Bendigo rocks to the southward along the line of strike is cut off by a newer granite, which is about ten miles across. To the south of this again comes the Castlemaine goldfield. The river gravels of this area, both recent and tertiary, were very rich in gold, but although a few rich "reefs" were found they did not prove of a permanent character, and mining is now at a very low ebb in the district. The structure of the country is similar to that of Bendigo. The anticlines succeed one another very rapidly, being only about three hundred yards apart, as a rule, and the strike is very constant. The main axis of elevation passes through the township of Chewton, about two miles east of Castlemaine, and the lowest beds contain a graptolitic fauna, apparently identical with that of Bendigo. Two or three other zones may be recognized overlying this one. *Tetragraptus fruticosus* does not range above the lowest zone. *Didymograptus bifidus* is the commonest fossil in the next zone, and the problematical *Didymograptus caduceus* of Salter marks the next. The other recognized species agree very closely with those of the Quebec group, species of *Tetragraptus*, *Dubograptus*, *Logarograptus*, *Goneograptus*, *Temnograptus*, *Thyllograptus*, *Dendrograptus* and *Thamnograptus* occur.

### THE MARINE TERTIARIES OF AUSTRALIA.

BY T. S. HALL, MA., CASTLEMAINE, AUSTRALIA.

TERTIARY beds of marine origin are extensively developed in the southern portion of Australia, forming a more or less broken fringe along the coastline from the head of the Great Australian Bight to the Snowy River in the east of Victoria. With the exception of a prolongation up the basin of the Murray River they do not extend far from the coastline and attain no great height above the sea. They are absent from the eastern coast of Australia, being apparently faulted below sea-level. Till of late years very little has been done towards the elucidation of the fauna, only a few species having been described. Recently, however, Professor Ralph Tate, of Adelaide, has done a great amount of work among the Mollusca and Echinoderms of the series and has enabled several workers to enter the field. The fauna is remarkably rich, especially in the older rocks, and not far short of 2,000 species have been recorded. The limit is far from reached, as fresh forms are coming to light at every new locality visited. Several papers descriptive of the beds as seen in different localities, with more or less imperfect lists of fossils, have appeared in the publications of the Royal Societies of South Australia and of Victoria. The most exhaustive one is by Mr. J. Dennant, on the beds of Muddy Creek, Victoria.\*

More recently Professor Tate and Mr. Dennant have, in

\*Trans. Roy. Soc. S. Australia.

the same publication, begun the work of correlating the whole series of beds as shown in the two colonies.

By Professor Sir F. M'Coy the lowest and most widely occurring beds are referred to Oligocene age, and he refers others, which differ lithologically, to the Miocene. Messrs. Tate and Dennant class both as Eocene, and it has been shown that in one locality at any rate the so-called Miocene really underlies the so-called Oligocene. The lists from Muddy Creek, above alluded to, show 511 recorded species, of which only one and a half per cent are living at the present day.

The fauna of the older tertiaries presents a more tropical aspect than that found on our coasts at the present day. *Murex*, *Vobeta* and *Cypræa* are extensively developed and often of gigantic size; the *Cypræa gigas* of M'Coy, for instance, is a very globose form and reaches the length of eight inches.

The strata consist of sands, clays and limestones, the latter being usually composed in the main of polyzoal remains. In some places an *Orbitoides* limestone occurs, the chief species being *O. Mantelli*. The clays yield the greatest numbers of forms, which in some places are beautifully preserved in a stiff blue clay that cuts like new cheese.

The Miocene beds of Tate and Dennant are not so extensively developed as the Eocene, while Pliocene beds with marine fossils are still rarer. In many places marine gravels occur, which have been ascribed to this age, but apparently on very slight grounds. Where they will be placed now is quite uncertain.

Below the lowest marine beds, and frequently separated from them by a denuded basalt-flow, is, in some places, a series of terrestrial and fresh-water deposits with plant remains with beds of lignite. These have, for many years past, been spoken of as Miocene. It is now proposed to remove them to the Cretaceous. It will be a strange thing if we have to wage war in a case so closely comparable with the Laramie one.

### THE SCIENTIFIC MAN ON THE FARM.

BY CHARLES B. COOK, OWASSO, MICH.

For many years the average farmer has been a man of few resources. His city brother has outwitted him in every department of his business. He has availed himself of no opportunity to secure a scientific education, and still worse, his county paper is the only periodical that ever enters his dwelling. As a result he is ignorant of the most vital laws that underlie farm husbandry in all of its branches and "farms it" in a general "go-as-you-please" style. These facts alone are sufficient to account for the farmer's general reputation as a man totally unfit for any other business. To make a bad matter worse, the illiterate farmer is continually belittling his profession to an extent that is limited only by his vocabulary.

In direct contrast to the above style of farmer the scientific agriculturalist is growing more and more to take hold of the farm, not only as a field for experiment and study, but as a vocation that will generously respond, financially, in direct proportion to the amount of mental force applied; for it is a fact just beginning to dawn on the minds of the public that the farmer's bank account compares most favorably with that of his professional brother, and where genuine ability prevails, coupled with a love for the vocation wherein one is called, the farmer's account is likely to run ahead.

The educated farmer of to-day is placed almost beyond competition, while the lawyer, the mechanic and the doctor find talented competition on every corner. The scientific man's education enables him to make the most