In the Teleostei (salmon), the chondrification of the basicranial bands takes place in a manner quite similar to that of *Lepidosteus*; but the fore part of the subocular bar is developed independently from the hinder part, and both, as well as the hyoid arch, separately from the skull.

In the simplest form of the reptilian skull—viz., that of the common snake—the trabeculae are direct continuations, in an attenuated rounded form, of the broad parachordal plates. They meet and unite in front without a median piece, and retain their embryonic condition throughout life. Two pairs of visceral arches are developed independently of the skull.

The development of the trabeculae as direct continuations primarily of the parachordals, is seen also in lizards, turtles, and crocodiles; but in the two latter, the trabeculae, as in the salmon, are segmented from the investing mass. Almost at the same time that the trabeculae are chondrified, an intertrabecula is developed as a rounded rod, and all three have the rounded form of the permanent trabeculae of the snake.

In the Amniota, unlike the low ichthyic forms, the investing mass rises high into the fold of the mid-brain, and the notochord with it. Thus is formed the large postclivoid wall.

The chondro-cranium of birds is developed in a manner quite similar to that of the crocodile and the turtle. This is especially to be seen in the *Struthionidae*; but that of the common fowl differs only in non-essentials. In all the *Sauropsida*, the visceral arches are developed independently of the cranium.

The difference between the early chondro-cranium of a mammal and that of the *Sauropsida* arises from the fact that the tissue which forms the whole of it, including the walls of the nasal and auditory capsules, chondrifies nearly at the same time, so that they can only be studied as separate parts before the tissue becomes cartilaginous. Afterwards, however, in the last stage of the skull, the ossification of the two sense capsules separately from that of the endocranium gives to their various parts a distinction which could not be seen even in the earliest stage of the skull. In mammals, as well as in *Sauropsida*, the visceral arches are developed independently of the basis cranii.

NOTE ON THE SANITARY CONDITION OF BAGSHOT PARK.

By W. S. PLAYFAIR, M.D., F.R.C.P.,

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It has been suggested to me by his Royal Highness the Duke of Connaught, that, as a matter of general interest to the medical profession, I should communicate a brief notice of the results of the careful investigation and reports made by Mr. Rogers Field into the sanitary condition of Bagshot Park, the defects in which are believed to have led directly to the Duchess of Connaught's late serious illness, from which she is now happily entirely convalescent. This is a suggestion I willingly comply with, in the hope that so prominent an instance of the danger that may arise from such faults of construction and workmanship as have been proved to exist may have the effect of directing attention to the paramount importance of questions of this kind.

It may be well to premise that the present house at Bagshot Park is not that long occupied by the late Sir James Clark, but an entirely new building, recently erected at a cost of from thirty to forty thousand pounds. As a matter of course, considerable pains were taken in the arrangements and ventilation of the drains; but it appears that, not only was the system adopted in itself defective, as was pointed out at the time of construction by Sir Howard Elphinstone, R.E., the Comptroller of His Royal Highness's household, but that the work was in many instances so carelessly carried out, that it is a matter of astonishment that more grave results have not followed. It is impossible to describe the whole system of drainage without reference to plans, but a few examples of the faults will show how readily, even in a new and costly mansion, the inhabitants may, without suspicion, be exposed to risks, the extent and subtlety of which it is difficult to estimate. For this purpose, I quote from Mr. Field's report, which has been placed in my hands. This was made after a thorough investigation conducted subsequently to Her Royal Highness's removal to Windsor, and it reveals a state of things which renders it astonishing that much more serious consequences did not long since arise. As a matter of fact, offensive smells had long been perceived about the house, and had been a common topic of conversation, but no one had suspected their origin, or had realised the dangers they were likely to cause. Many of

the inmates, however, had suffered from various forms of indisposition, such as sore-throat, diarrhoea, and a general sense of heaviness and *malaise*; and these chiefly affected newcomers. Of all this, it is needless to say I knew nothing until after the Duchess's accouchement; neither did Dr. Laking nor I think much of it until serious symptoms had shown themselves.

A few examples of the defects discovered will suffice to show what was really the state of the sanitary arrangements. "The drains, taking certain baths and sinks, run underneath the house, with two chambers in their course, likewise underneath the house. Connected with these bath-drains are several land-drains, constructed of ordinary jointed pipes. This, I need hardly point out, is a very objectionable arrangement, as the bath-drains are in unbroken connection with soil-drains, the unventilated trap forming no reliable security against the passage of foul air."

All the drains inside the house, and immediately around the house, "were found, without exception, to be leaky, some of them exceedingly so."

On testing the drains, taking the soil-pipe from one closet, "water ran out of the pipe through the wall into the basement, and, on opening up the pipe just outside the wall, it was found to be not only badly jointed, but broken, and there was an accumulation of filth which had run from it into the ground."

"The bath and sink-drain under the house was so completely stopped up with a slimy deposit, that it was some time before any water could pass down it."

"On examining the basement on his first visit, my assistant noticed a vertical lead-pipe communicating directly with the soil-drains. On inquiry, he was informed that this pipe was intended for a sink which had not been fixed; and he was assured by the clerk of the works that the upper end of the pipe had been cut off and carefully sealed up. It was afterwards discovered that there had been no attempt at sealing up the pipe, but that the upper end had been left open immediately under the floor of the vestibule, and thus afforded a free passage for foul air into the house."

"All the closets had a disagreeable smell, and some of them were excessively offensive."

"The waste-pipes of the baths are in unbroken communication with the drains, instead of discharging with open ends outside the house, as they should do."

"The waste-pipes of two of the sinks have unbroken connections with the drains in the basement."

The following is specially interesting under the circumstances which led to this investigation. "In order to ascertain how far the smell from the leaky drains and rain-water overflow in the basements would penetrate, I applied the smoke-test, by burning specially prepared paper in the basements under the central saloon, study, waiting-room, and vestibule. The smoke was seen to issue in great volume from the hot-water coils in the saloon, and a strong smell of smoke was perceived in the study, waiting-room, and vestibule. It was also proved that the smoke passed from the saloon into the Duchess's bedroom. Again, on burning the special paper in the hollow wall at the back of the heating furnace, the smoke found its way into the dining-room, up the casing of the soil-pipe into the Duke's dressing-room, and thence into the Duchess's bedroom. From the foregoing tests, it will be seen that there were two distinct and easy ways by which the foul gases from the drains in the basement could find their way into the Duchess's bedroom."

I have quoted a few only of Mr. Field's discoveries, but these, I think, will amply justify his general conclusions that "the construction of the drainage both round and inside the house is very defective. This faulty work is undoubtedly the cause of the offensive smells that have been noticed; and the defects are so grave, that I consider the house, in its present condition, unsafe for habitation from a sanitary point of view."

The whole question of the effects of defective sanitary condition on the puerperal state is one which deserves much more serious study than it has ever yet received. I have long been satisfied that they have often much to do with grave forms of illness in the lying-in state, the origin of which cannot otherwise be traced. In the chapter on "Puerperal Septicæmia" in the third edition of my work on *The Science and Practice of Midwifery*, I wrote as follows: "Exposure to sewer-gas may, I feel sure, produce the disease. In two cases of the kind I had the opportunity of closely watching, an untrapped drain opened directly into the bedroom, in one instance into a bath, in the other into a water-closet. Both cases were indistinguishable from the ordinary form of the disease, and in both improvement commenced as soon as the patient was removed into another room."

The two cases here mentioned are by no means the only ones I have had an opportunity of observing; and I have long had it in my mind

to direct more marked attention to this topic. In a case I saw some years ago in Notting Hill, which I referred to in the discussion on puerperal fever at the Obstetrical Society, the patient, who had been confined within a week, had all the symptoms of a most intense attack of puerperal septicæmia, but none of a diphtheritic character, while her husband lay in an adjoining room suffering from a diphtheritic sore-throat. Here, the waste-pipe from the bath was found to communicate directly with the sewer. In spite of her intense illness, I had the patient removed to her mother's house in Holland Park, and from that moment she began to improve. In August of last year, I saw, with Dr. Parsons of Notting Hill, another similar case, in which the same source of disease was detected. Here, again, we had the patient taken away from the infected atmosphere, into apartments in the next street, a step which was instantly followed by an amelioration in her symptoms. Besides these cases, I know of three others, which ended fatally, in which I have every reason to believe that the cause of the disease was poisoning by sewer-gas.

On the case of Her Royal Highness, it is impossible for me, for obvious reasons, to comment; this much, however, I may say, that, very fortunately, her symptoms did not commence for more than a fortnight after her confinement, when the influence of the puerperium was happily much lessened; and that her removal was, as in the cases above mentioned, immediately followed by a most remarkable and instructive change for the better.

ARE HOMES FOR CONVALESCENTS FROM SCARLATINA DESIRABLE? AND, IF SO, AT WHAT PERIOD CAN THE PATIENTS BE SAFELY REMOVED TO THEM?*

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My answer to the first question in the title of this brief paper, which is written merely with the view of provoking, or rather of keeping up, the discussion of a subject of great importance in public hygiene, shall be mainly in the form of a narrative of the endeavours that have been made in the metropolis, during the last two years, to provide a practical solution of a problem which does not now for the first time occupy the attention of the British Medical Association. Two years ago, at Cork, it was the chief subject of interest in the Public Medicine Section, and was introduced in two very able and thoughtful papers by Dr. J. W. Moore of Dublin and Mr. Vacher of Birkenhead, on the provision of homes for convalescents from acute infective diseases. Those papers, and the animated discussion they awakened, showed that there existed a deep and general conviction of the need of such establishments, though the very comprehensiveness of the survey taken of the extent of the evil, of the measures required to meet what was felt to be an acknowledged defect in our public sanitary arrangements, and of the funds requisite for their execution, rather damped the ardour of the most sanguine, and suggested the fear that the adoption of the plan propounded by Dr. Moore was a vision of a somewhat distant future. It so happened that, on the morning of the day on which the discussion took place, I received from a lady in London, who was not then personally known to me, a letter requesting my counsel and aid in carrying out a project she had herself devised for providing a home for convalescents from scarlatina. On my return to town, I acquainted myself thoroughly with her views; and believing them to be sound and practicable, I advised her to enlist the sympathy, and obtain a public declaration of the collective opinions, of the leading members of the medical profession in the metropolis and its neighbourhood. To many of these I gave her notes of introduction; and the result of Miss Wardell's earnest efforts was that, in the course of a few weeks, the following declaration was signed by eighty-five medical men, including the Presidents of the Colleges of Physicians and Surgeons, Sir Thomas Watson, Sir George Burrows, Dr. Acland, and a large number of the most eminent physicians in London.

"We, the undersigned, cordially approve of Miss Mary Wardell's proposal to establish an institution for the reception and isolation of convalescents from scarlet fever, as likely to promote their more complete recovery, and also to check the spread of that formidable disease. And trusting, as we do, that its success will lead to its general adoption, we earnestly recommend this first attempt to supply a great and acknowledged want in the sanitary arrangements of the metropolis to the large and liberal support of the public, especially as the attempt will be made to render the institution partially self-supporting."

* Read before the British Medical Association at Ryde, August 1881.

Such an emphatic declaration of opinion, made deliberately and after full consideration by so large a number of eminent and experienced medical men, may be fairly taken, it appears to me, as the decisive answer of our profession to the question, Are homes for convalescents from scarlatina desirable? Yet there was not complete unanimity among those who were applied to, for two physicians in the highest position declined to sign the document presented to them; and one whose opinion on most sanitary questions is of great weight, also declined, on the ground that there would be no demand for the advantages of the home, supposing it were established. On the other hand, several, who were deeply interested in the subject, expressed their doubts of Miss Wardell's being able to carry out her project effectively by her unaided efforts, and wished her to co-operate with others who have associated themselves together to promote the establishment, on the large scale, of convalescent institutions for various infective diseases. While it is interesting to observe this substantial unanimity of professional opinion, and the desire of some to grapple at once with the intricacies and difficulties of the whole question, as was attempted two years ago by Dr. Moore and Mr. Vacher, I believe it is wiser to try the experiment with a single disease, so as to test practically the two questions of demand on the part of the public, and of the mixture of class, sex, paying, and gratuitous. In the draft regulations, as drawn up by Miss Wardell and amended by Dr. Buchanan, the tentative character of the institution which it is sought to establish is clearly set forth, when it is said that it is to be *at present* "for scarlet fever convalescents only." The smaller experiment will show the weak points in the working of the organisation, and will prepare the way for the extension of the system.

That the need of such institutions is felt by others than medical men is very plain, from the following statement of the honorary secretary of the London Fever Hospital, quoted by Sir Rutherford Alcock in the memorial addressed to the President of the Local Government Board. "There are no special homes to which convalescent patients from the London Fever Hospital are sent. Indeed, I am not aware that there is any home to which such patients can with safety be sent from any London hospital. The Committee of the London Fever Hospital have long been anxious to establish such a home; but they have hitherto been deterred from the attempt, in consequence of the heavy outlay which it would entail. The course now adopted is to keep the patients in the convalescent wards of the hospital until they can be discharged without the risk of communicating the infection to others. If the committee had a convalescent home, the stay of the patients in hospital might be considerably shortened." This implies more room for, and a more rapid admission of, acute cases into the Fever Hospital, and, if such convalescent institutions were multiplied, also into the Metropolitan Asylums. This is another, and a very practical answer, to the question: Are convalescent homes desirable? The high probability, amounting almost to certainty, that removal to pure country air would render convalescence much more rapid and complete, is another economical argument which tells powerfully in favour of convalescent homes.

With the view of helping forward Miss Wardell's beneficent project, a committee was formed some time ago, which approved and adopted the general principles and regulations which are to govern the institution when it is established. Its site is, if possible, to be within easy reach of London, but in a rural district not likely to become urban. The transport is to be by carriage, or ambulance, belonging to the home; and this, if it goes by rail, shall be put upon a truck, which may be disinfected if thought necessary, as shall also the ambulance itself. The management shall be by a small lay committee, with one medical member, whose time and engagements will permit of his attending every meeting, and who shall be the medium of communication with the Medical Council, which, being composed of seniors of high standing in the profession, shall be the ultimate authority in all questions of a medical or sanitary nature.

Probably the most effective argument for such an institution, and that which will be most readily and thoroughly appreciated by the mass of the community, is that drawn from the rapid increase of this, amongst us, formidable and fatal malady, which was so ably handled by Sir Rutherford Alcock at the Mansion House meeting, presided over by the Lord Mayor, on the 27th of last June. It appears from the Registrar-General's returns, that the deaths from scarlet fever in London were, in 1877, 1576; 1878, 1,792; 1879, 2,706; 1880, 3,073; showing a mortality that has nearly doubled in the course of four years. To this it may be objected that the years 1879 and 1880 were years of "epidemic prevalence", and that the mortality for this year may not exceed a few scores. But the experience of many years proves that what *may* happen *does not* happen in the case of scarlatina. Only in two years out of eleven has the annual mortality fallen below 1,576, which is the minimum mortality since 1873. While the victims of